

TubeMaster

Instruction for operation

(V3.0)



Shanghai Fangling Software Co.,Ltd

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1. Introduction

Due to the continuous update of the software functions, the software you are using may differ from what is stated in this instruction in some aspects.

This software is a sophisticated tube nesting software for intersecting line calculation, nesting and cutting code. Users only need to import the parts and the software can automatically calculate cutting lines and generate cutting code. The function of the automatic nesting enables you to cut the raw material into multiple sections at one time without manual intervention. At the same time, the automatic nesting achieves the optimization of the use of raw materials which save material as well as cutting time, improving the efficiency of the cutting machine.

TubeMaster is divided in 2/4/6 axis. This instruction is base on 6 axis. The functions will be marked which 2&4 axis do not support.

The advantages of the software:

- It is very convenient for users to create models by setting parameters.
- The models can be generated to G code easily which is very convenient for users to make samples.
- Support to import files of stp. / sj. /igs format.
- Support to import the part in any direction.
- Support to re-import the cutting code to examine the correctness.
- Multiple raw material can be nested at same time, and the number of parts after nesting can be automatically subtracted.
- Users can check the utilization rate as well as export or print the nesting results.
- Abundant technological parameter settings, such as leads/compensation/start point/common edge/parts expansion, etc.
- Animation simulation which enable users calibrate the track line quickly.
- Cutting lines can be selected separately as well as reverse or close to meet different requirements.
- Trepanning order can be changed as needed to find the best move path.
- The parts can be rotated/overtured or moved by manual nest.
- The cutting path can be set bevel or position offset to prevent deformation error.
- Auto nest: support different types of tubes nest at same time in a variety of nesting ways,such as long/short part or import order nest firstly .

The software is extensible and it is completely independent intellectual property product. If users have special requirements, we can customize the development according to their needs for our company owns all the core technologies and source code of the software.

1.1Disclaimer

This software can provide a programming environment for tube cutting. However, since tube cutting is complex, this software cannot guarantee that the

correct cutting code can be generated under any circumstances.

Before using cutting code for actual cutting, users should conduct relevant verification. Users have the responsibility to check and verify whether the generated cutting code is correct.

Please carefully modify the G code file setting to avoid affecting the cutting direction. Our company assumes no responsibility for any problems and all consequences arising from improper operation of users or failure to perform the inspection and verification.

1.2 Operating environment

This software needs the following system environment to operate:

Hardware requirements	CPU: above 1.0GHz
Memory	Above 2G
Hardware	Above 10GB
Operating system	WIN7 or upgrade version
.Net Framework	V4. or above

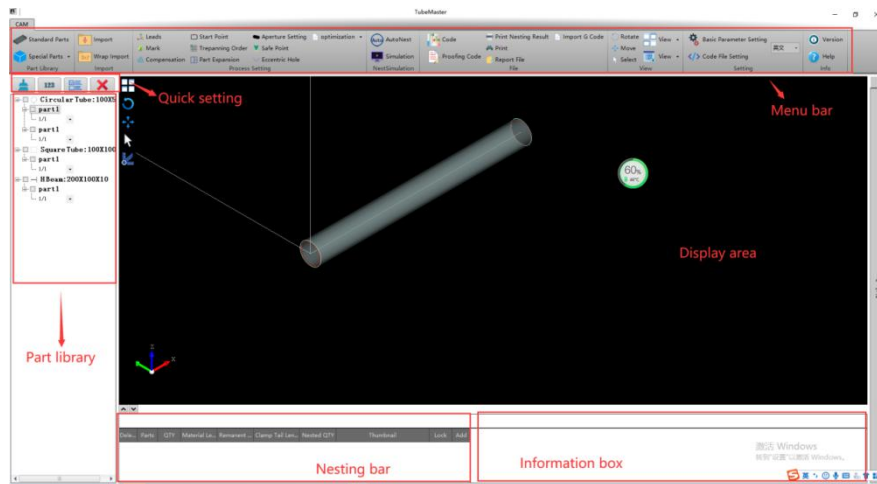
1.3 Software installation

You can directly run the installation program after checking. To install the software, you will require local administrator permissions. In order to avoid problems, it is very important that you temporarily disable the antivirus program on your computer before installing.

Please read the Installation Agreement carefully before the installation. Your installation and use of the software will be deemed as acceptance of the Installation Agreement, and you agree to be bound by the terms of the Installation Agreement. If you do not accept the installation agreement, do not install and use this software.

The software can be opened only need to click the shortcut icon on the desktop after the installation.

2.Part



Menu bar:A variety of techniques can be found directly under the menu bar. Function detail will be displayed when the mouse close to the icon

Quick setting:Quickly select all or select parts to delete or batch set the quantity of parts.

Part library: Display the parts that need to nest.

Display area:The black area in the center of the interface is the display area.

Nesting bar: The nesting result will be displayed here.

Information box: Users can check the operation steps, error prompts and follow the software prompts. Different prompt messages are displayed according to different operations.

Part Library

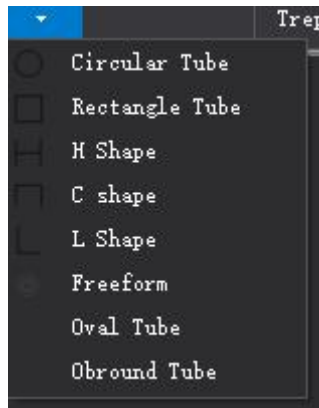
2.1 Standard part

2.1.1 New

2 axes edition supports: Circular Tube.

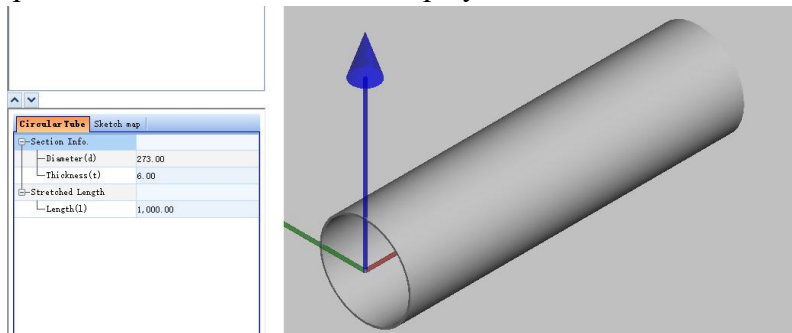
4 axes edition supports: Circular Tube/Rectangle Tube/H Shape/C Shape/L Shape/Freeform part/Oval tube/Obround Tube.

6 axes edition supports: Circular Tube/Rectangle Tube/H Shape/C Shape/L Shape/Freeform part/Oval tube/Obround Tube.

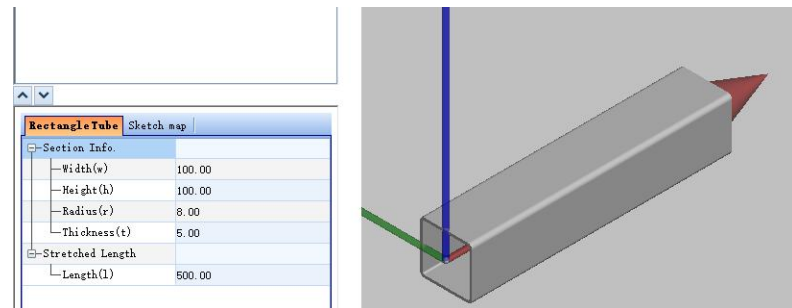


Circular Tube:

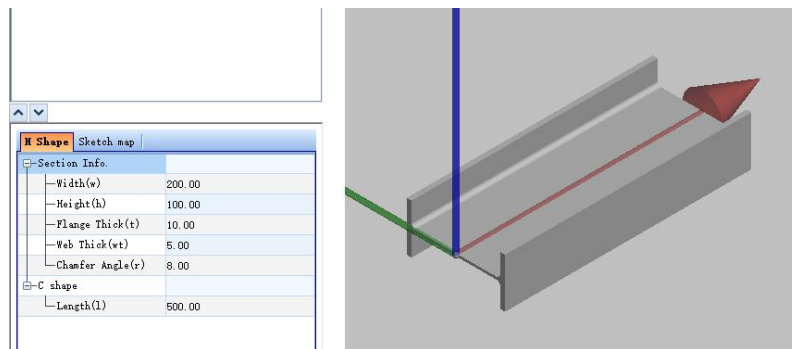
Parameters required to generate the tube are as follows. Click “Apply” after input the right parameters. The tube will be displayed in the software.



Rectangle Tube: Parameters required to generate the tube are as follows. **(2 axis does not support this function)**

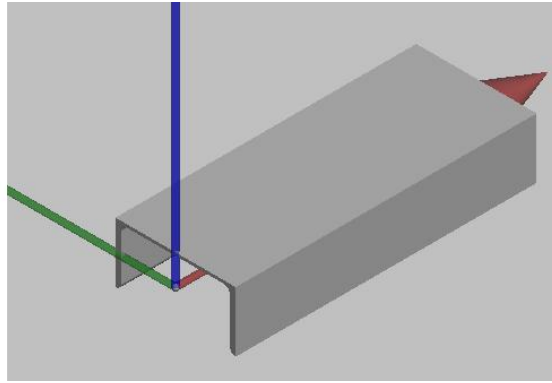


H Shape: Parameters required to generate the tube are as follows. **(2 axis does not support this function)**



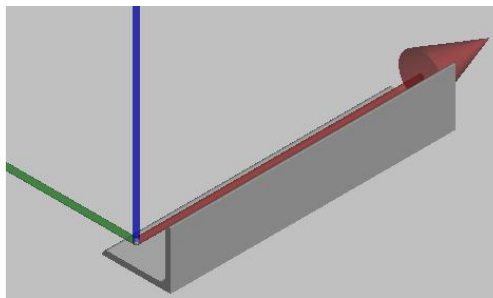
C Shape: Parameters required to generate the tube are as follows. **(2 axis does not support this function)**

C shape	
Section Info.	
Width(w)	200.00
Height(h)	100.00
Flange Thick(t)	10.00
Web Thick(wt)	5.00
Stretched Length	
Length(l)	500.00



L Shape:Parameters required to generate the tube are as follows. (2 axis does not support this function)

L Shape	
Section Info.	
Width(w)	120.00
Height(h)	100.00
Flange Thick(t)	10.00
Stretched Length	
Length(l)	500.00



Freeform part (2 axis does not support this function)

The software supports to import freeform parts. Users need to import the section file of the tube(dwg/dxf) and set the thickness and length and apply it.

Freeform	
Section Info.	
Section Info.	Import
Thickness(t)	10.00
EquiDis Entity	
Outer Expand	<input type="checkbox"/>
Inner Shrink	<input checked="" type="checkbox"/>
Stretched Length	
Length(l)	500.00
Rotate	
X Rotate	0.00

Section info.: Import the section file of the freeform tube (dxf/dwg).

Thickness: The thickness of the freeform tube.

Outer expand: The line of the section is the inner line, the software will draw the outer line according to the thickness.

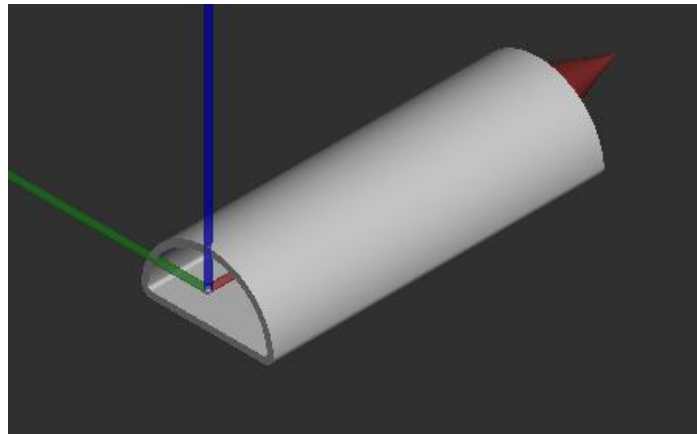
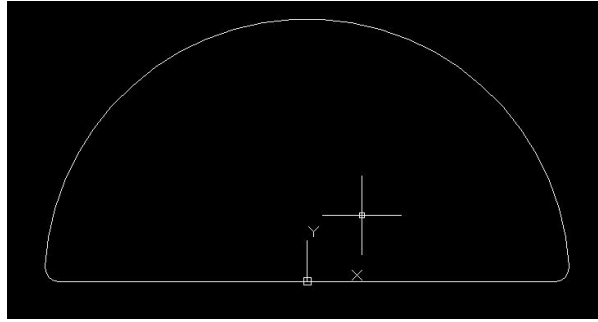
Inner shrink: The line of the section is the outer line, the software will draw the inner line according to the thickness.

Length: The length of the freeform tube.

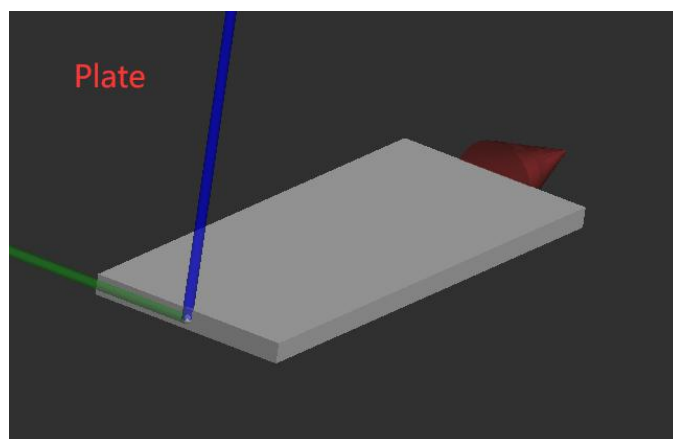
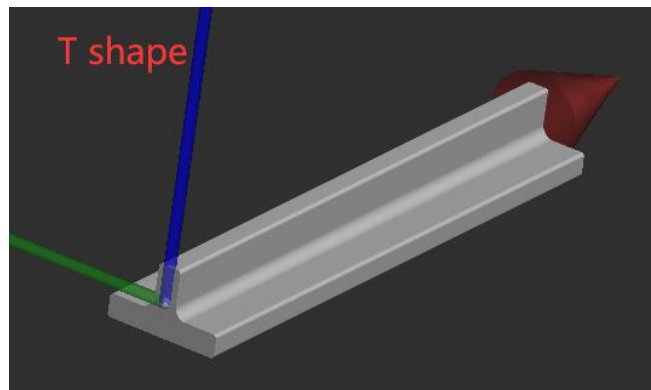
X rotate: The section of the tube will rotate around X axis.

For example:

Import the section file of “D shape” and input the thickness and length.

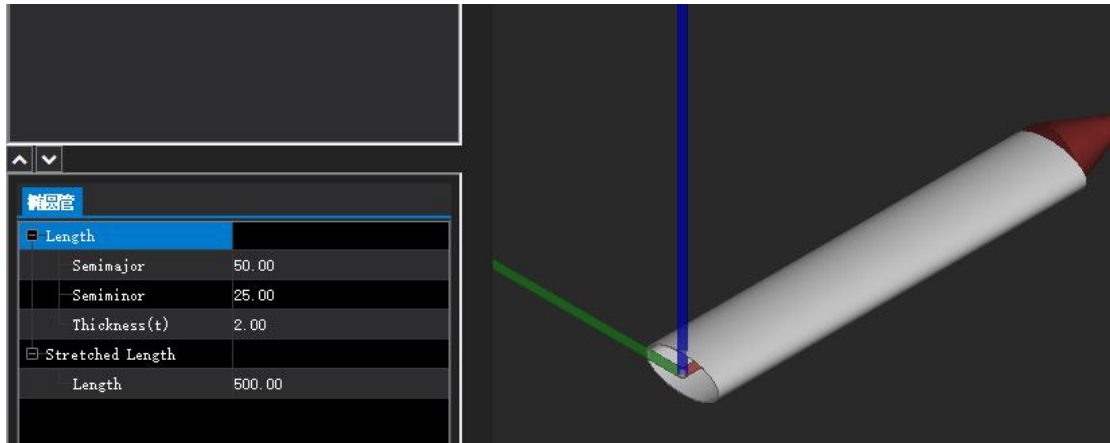


If the user doesn't choose the outer expand and inner shrink neither, the tube will be solid.

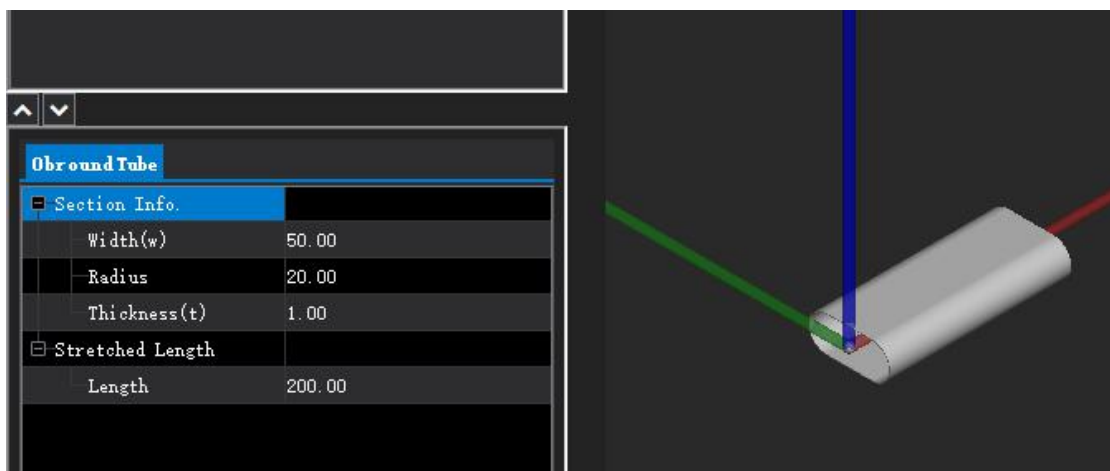


The created freeform tube can be opened holes and cut off. (Please refer to the section of **Opening and Cutting off** for specific operation) . The freeform tube can be saved or export to nest and generate cutting code. (Please refer to the section of **Nesting** for specific operation).

Oval tube:Parameters required to generate the tube are as follows. **(2 axis does not support this function)**



Obround Tube: Parameters required to generate the tube are as follows. **(2 axis does not support this function)**



2.1.2 Open

In addition to generate parts in the software, it also support to import parts to edit. (trepanning /cut off/ V groove)

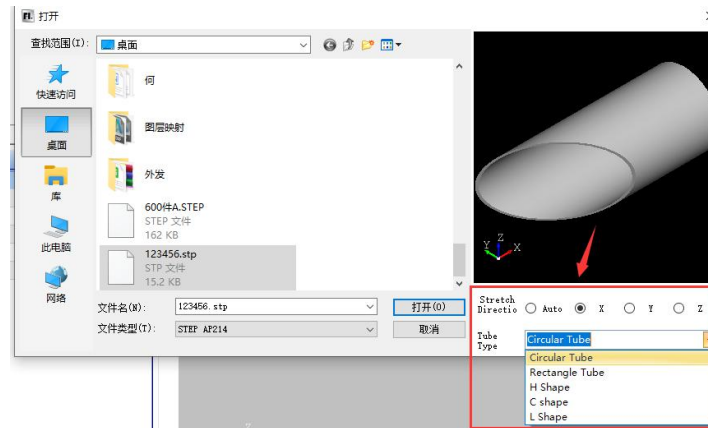
The import model is divided into importing stp /sj files. Importing STP format file can only be an entity import which can't distinguish the holes and other information. After importing SJ format file, it will automatically record every operation step, distinguishing holes and other information. Open sj file format file and all the operation procedures and steps will be reproduced in the software.

After selecting the part, the thumbnail will be displayed on the right side, and the

user needs to choose the stretching direction and the type.

If the stretch direction is not in the X/Y/Z, you can choose “Auto” direction.

Note: When the diameter is bigger than the tube length, please choose the stretch direction manually. (Don't choose “Auto” direction)



2.1.3 Save

After generating the entity model, select the parts of the parts list and save the parts. The format of the saved part is STP format or SJ format.

Note: The location of the saved part cannot be in Chinese, nor can the model name be in Chinese.

Users can choose to save only the SJ file and forbid to save the STP file which can speed up the import of the circular tube.

Prohibit to save stp format(CIR Tube)

2.1.4 Branch Trepanning

Users can open the holes on the tube.

Take round hole as an example, other trepanning can refer to the opening of round tube.



Round hole:

Users need to set the parameter of the round hole.(Length unit is “mm” and Angle unit is “° ”) Users can choose to preview to check.

Section Radius: The radius of the round hole.

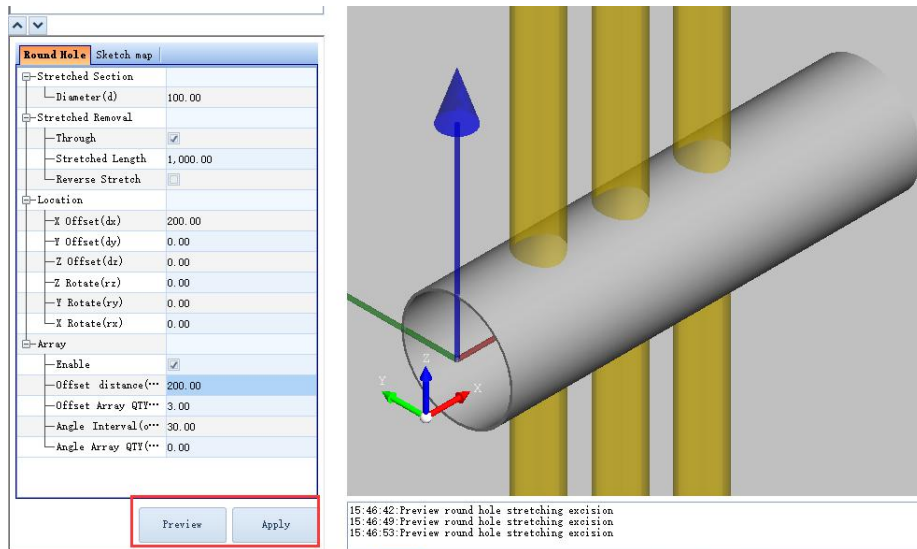
Through: Cut through the tube with symmetrical holes on both sides

Stretched length: The trepanning stretched length.

Reverse Stretch: The trepanning on the reverse direction.

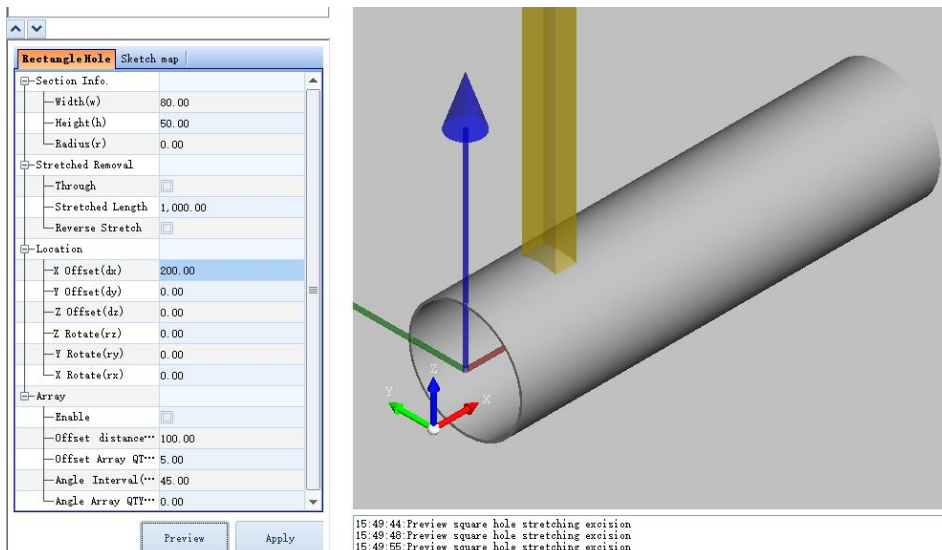
Location: The offset of the opening position can be changed on the X/Y/Z axis or rotate on X/Y/Z axis.

Array: The holes can be arrayed by distance or by Angle.



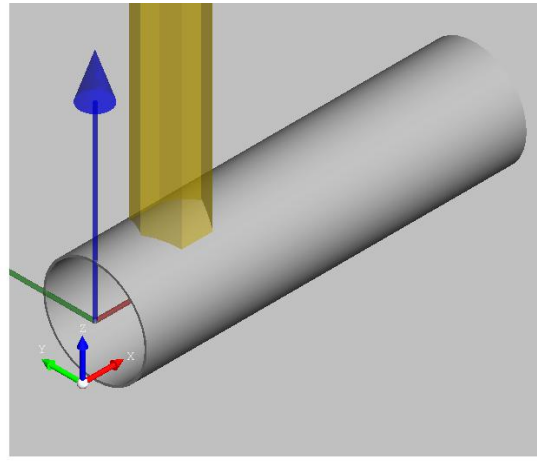
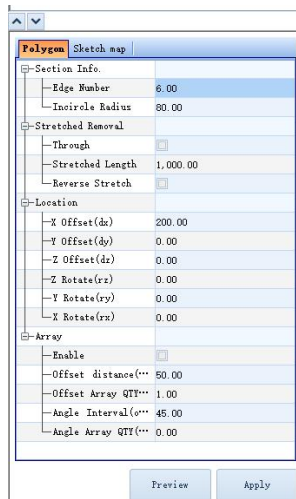
Rectangle Hole:

Users can set the parameters of the hole as needed.



Polygon Hole:

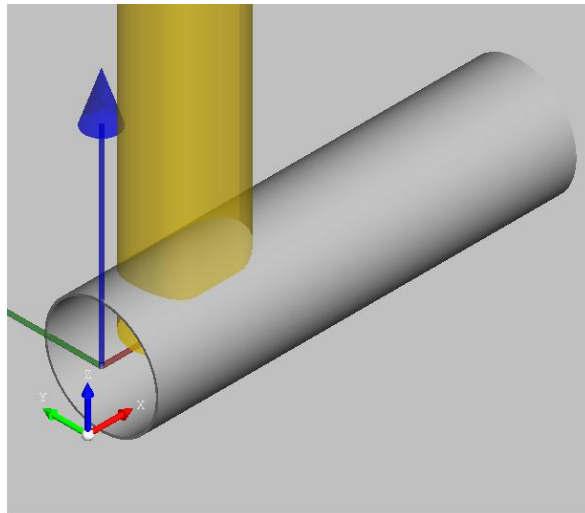
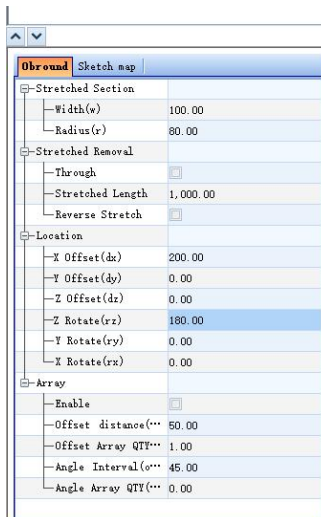
Users can set the parameters of the hole as needed.



15:50:42: Preview polygon hole stretching excision
 15:50:46: Preview polygon hole stretching excision
 15:50:57: Preview polygon hole stretching excision

Obround Hole:

Users can set the parameters of the hole as needed.



Freeform hole:

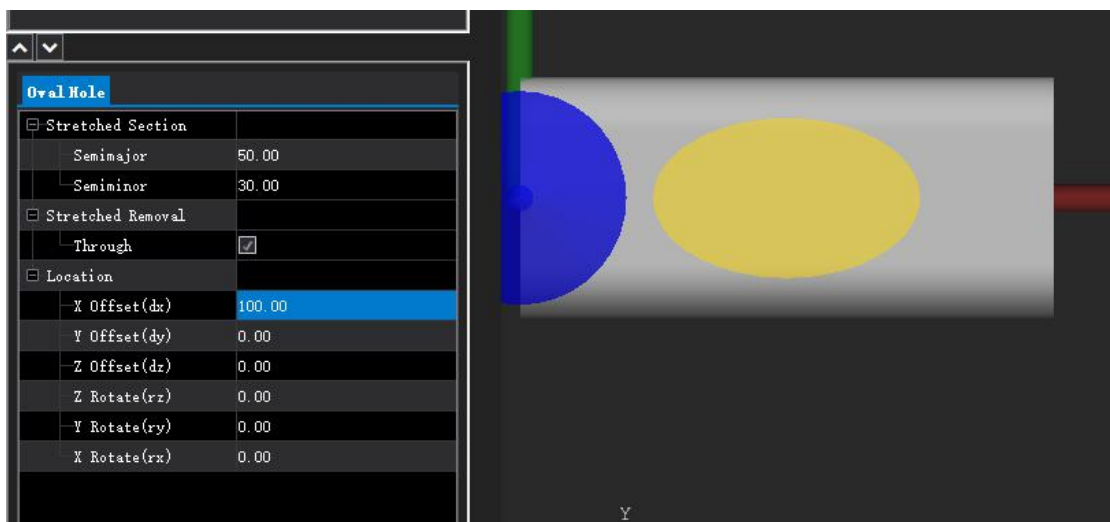
The operation method is similar to the generation of freeform parts, which need to import the section profile dxf/dwg file. The profile is the closed line segment based on XY plane drawing.

Users can choose whether to run through or offset the holes as needed after importing the section profile dxf/dwg file. Users can also enable the array function as required.

Freeform Hole	
[-] Section Info.	
[-] Section Info.	
[-] Stretched Removal	
[-] Through	<input type="checkbox"/>
[-] Reverse Stretch	<input type="checkbox"/>
[-] Location	
[-] X Offset(dx)	0.00
[-] Y Offset(dy)	0.00
[-] Z Offset(dz)	0.00
[-] Z Rotate(rz)	0.00
[-] Y Rotate(ry)	0.00
[-] X Rotate(rx)	0.00
[-] Array	
[-] Enable	<input type="checkbox"/>
[-] Offset distance(offx)	50.00
[-] Offset Array QTY(xn)	1.00
[-] Angle Interval(offa)	45.00
[-] Angle Array QTY(an)	0.00

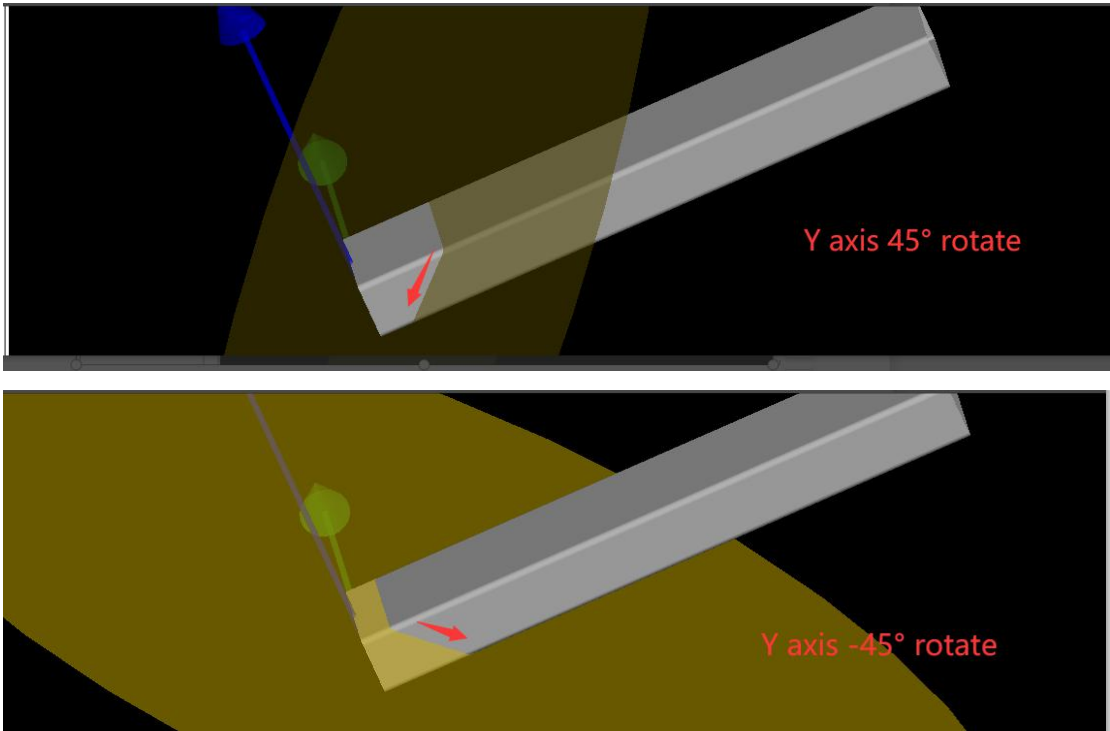
Oval Hole: (2 axis does not support this function)

Users can set the parameters of the hole as needed.



2.1.5 Cut Off

Users can cut off parts according to their own needs. After inputting the position to be cut off, users can choose to keep the left or right side of the part. Users can also choose the cutting direction, the positive Y-axis direction (the cutting surface is to the right); Negative Y-axis (cutting surface to the left).



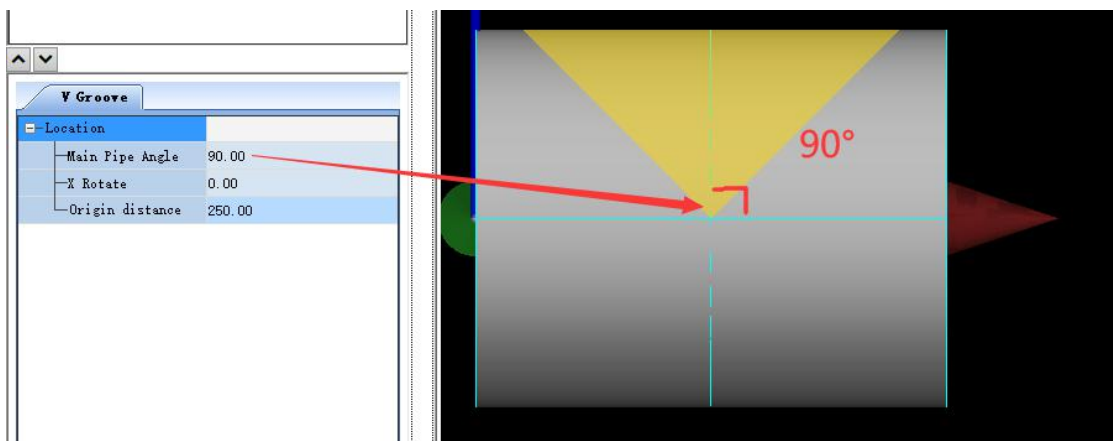
2.1.6 V Groove

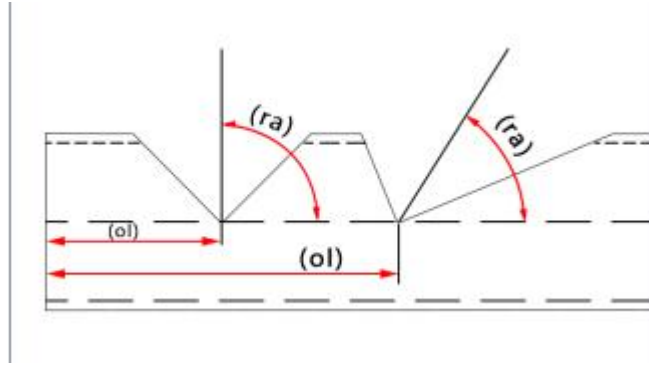
Users can set the parameter as needed. (Only support circular tube)

Main Pipe Angle: The Angle between the V-groove axis and the central axis of the tube.

X Rotate: The angle that V-groove rotate on X axis.

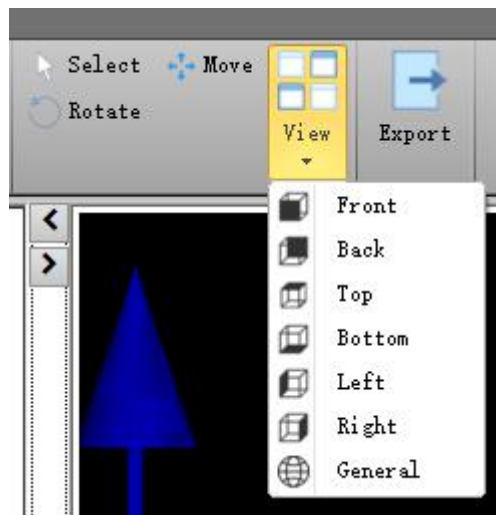
Origin Distance: The distance from the original point (0,0,0).





2.1.7 View

To facilitate the user to better observe the model, the model can be selected, rotated, moved, or selected from different views.



2.1.8 Export

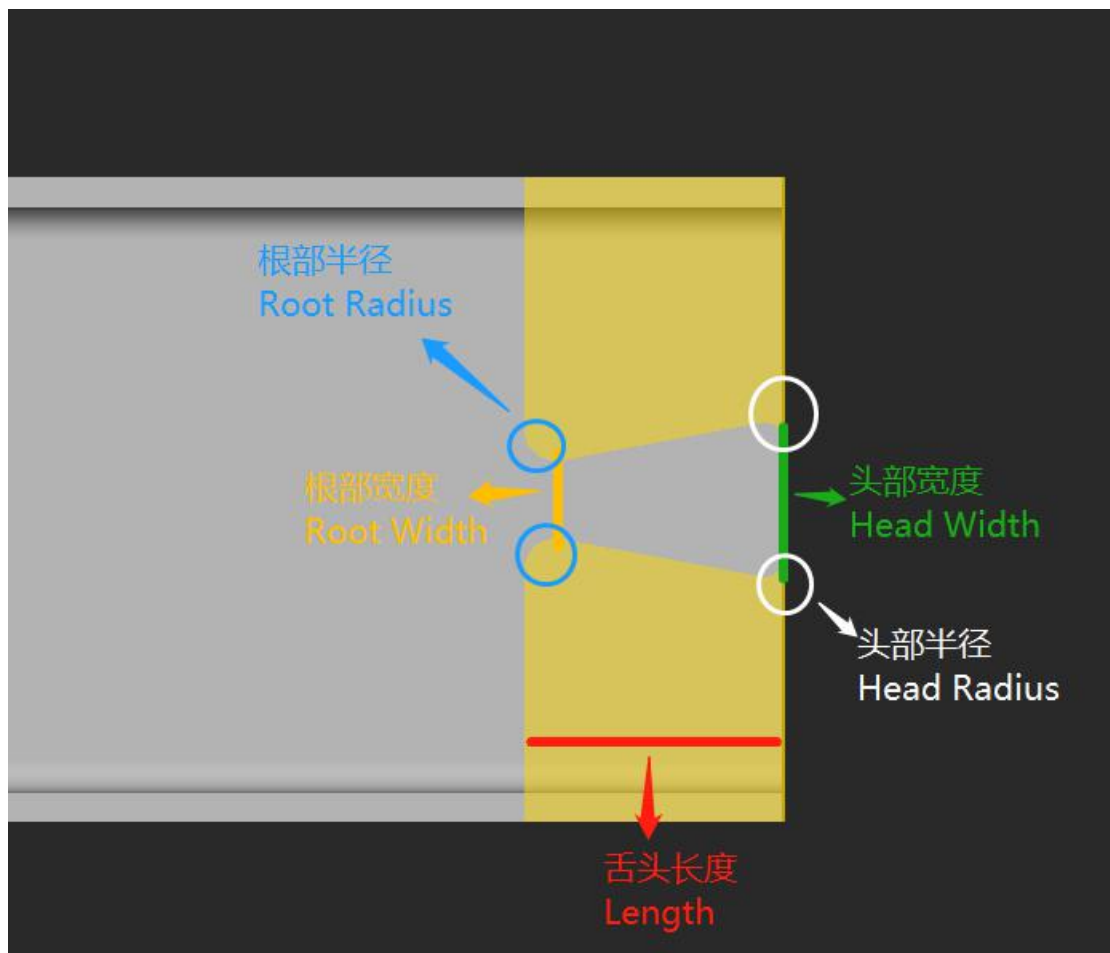
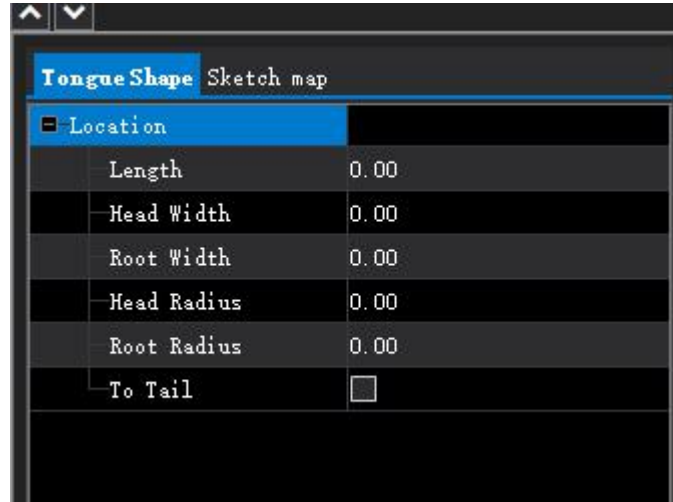
After creating the model, the user can save the model to the local or directly export it to the nesting interface. After exporting, part information will be displayed on the left side of the software, and part entity will be displayed in drawing area.

Note: If the export speed of Cir tube with many round holes is very low, you can tick the function "Cir tube speed-up".



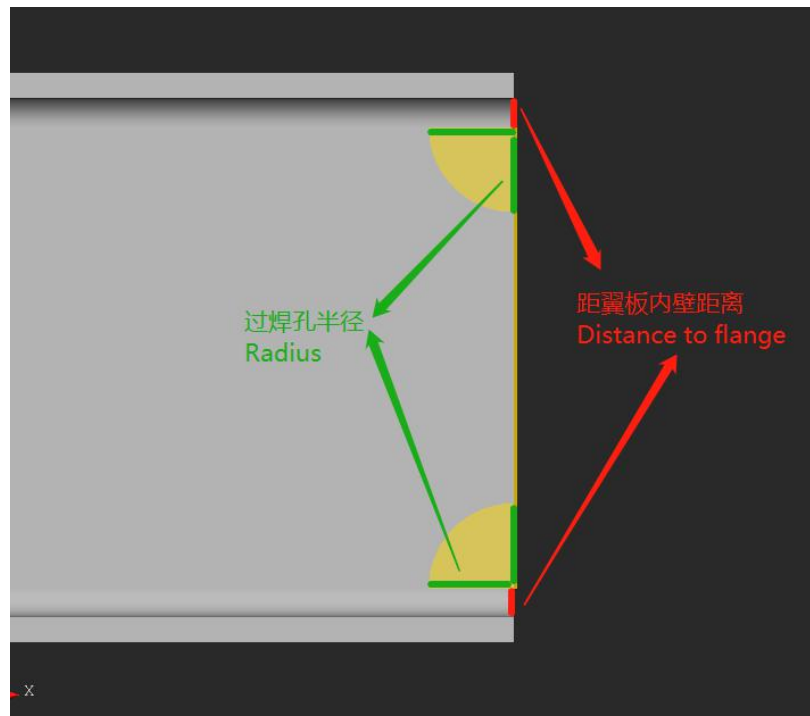
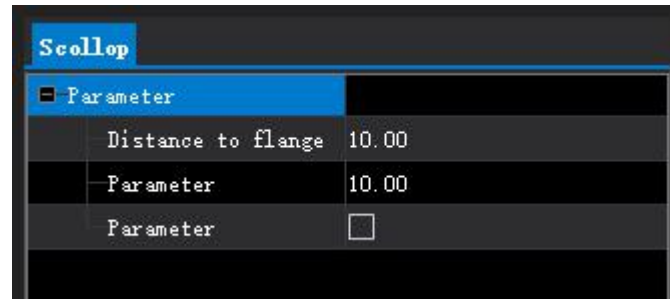
2.1.9 Tongue Shape

Users can set the parameter as needed. (Only support H/C/L shape tube) **(2 axis does not support this function)**



2.1.10 Scollop

Users can set the parameter as needed. (Only support H shape tube) **(2 axis does not support this function)**

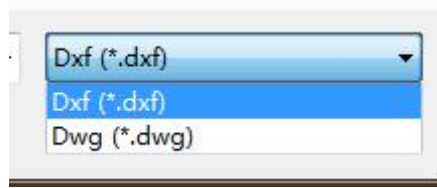


2.2 Special Parts

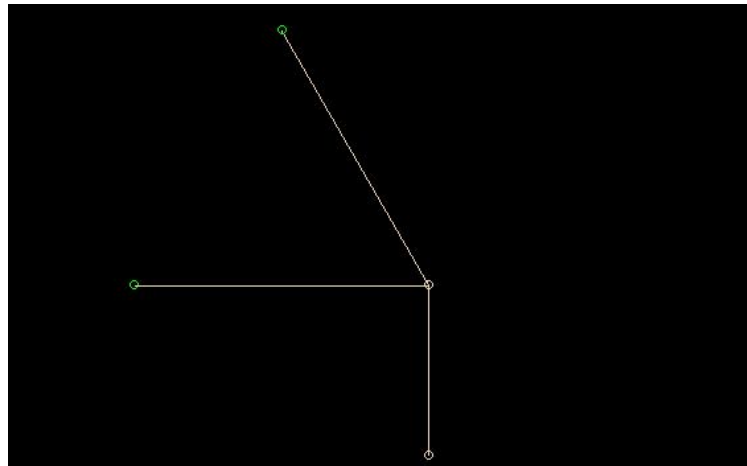
2.2.1 DXF/DWG Modeling

2.2.1.1 Open

Users can import dxf or dwg file.



There are axes in the display area after importing.

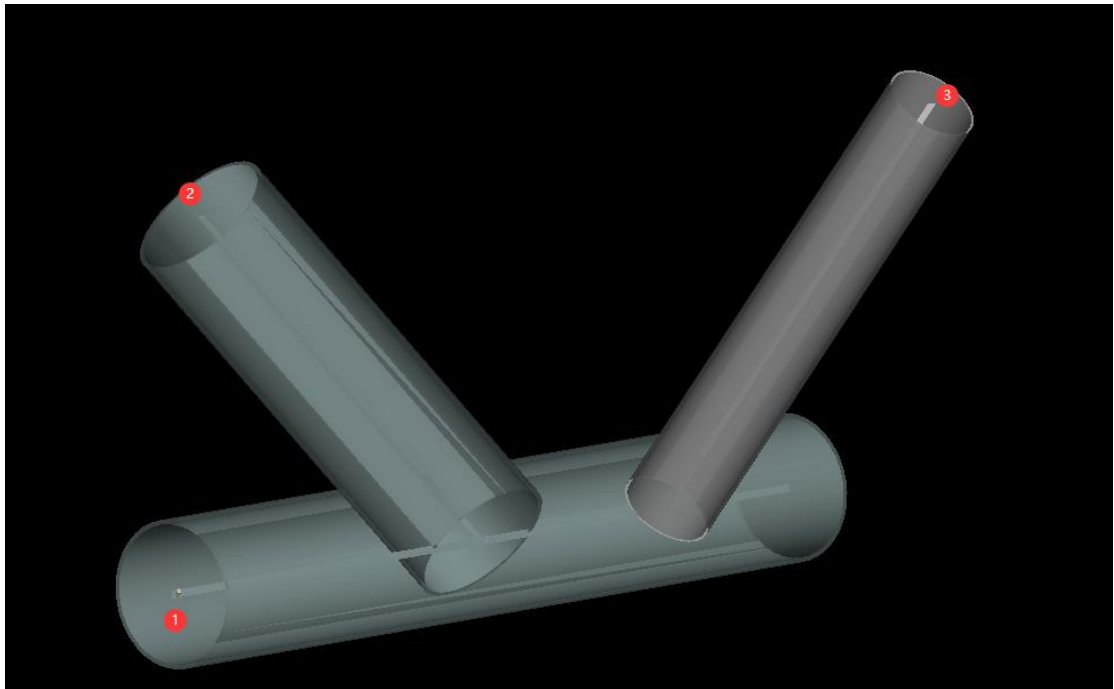


Then users can generate the axis into tube to nest.

2.2.1.2 New

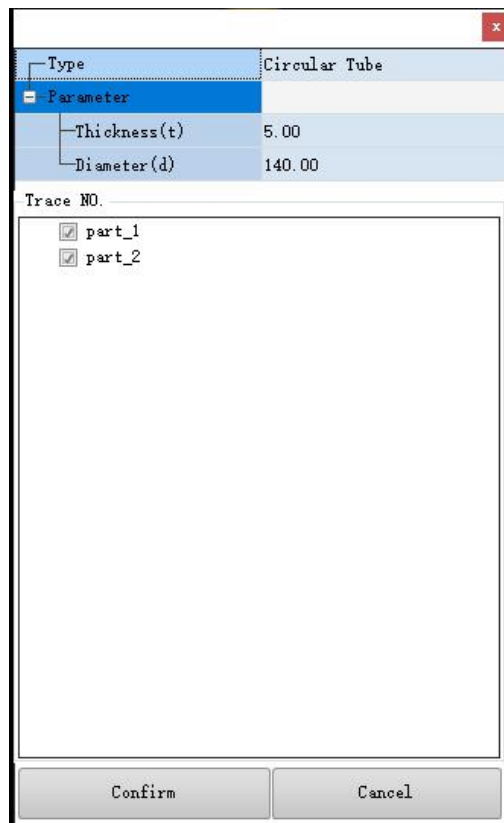
Users can input the coordinate of start point and end point and the diameter and thickness to create the tube.

Tube Type	Circular Tube
Trace NO.	part_1
Start Point Coordinate	
X	0.00
Y	0.00
Z	0.00
End Point Coordinate	
X	1,000.00
Y	0.00
Z	0.00
Diameter (d)	
Value	30.00
Thickness (t)	
Value	1.00
Confirm	
Cancel	



2.2.1.3 Modify Model

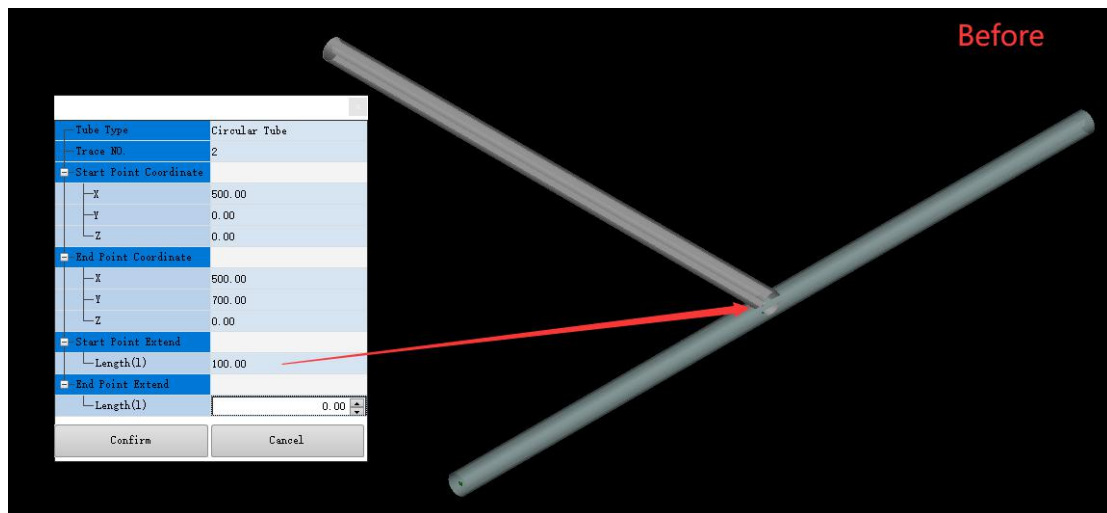
The created axis can modify the thickness and diameter according to the selected track number.

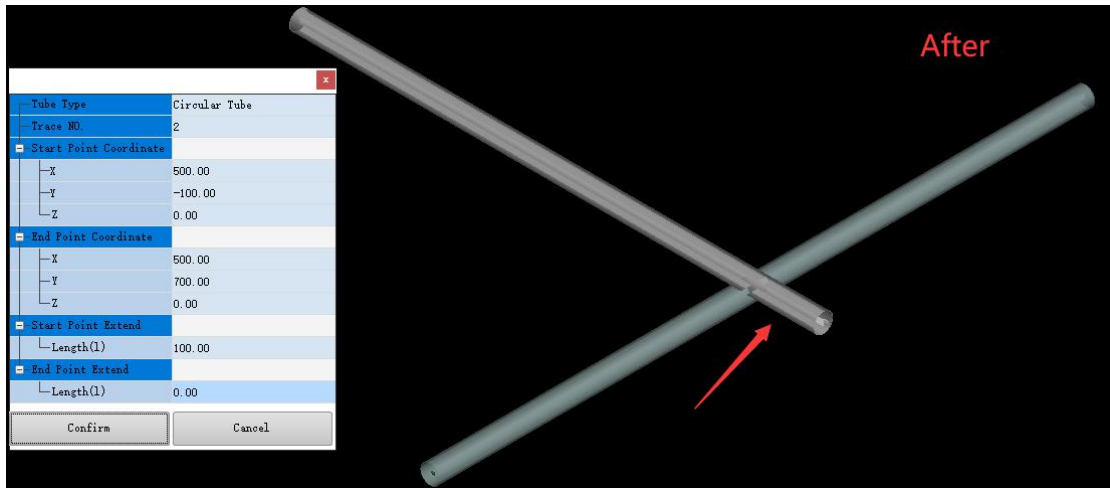


2.2.1.4 Extend Axis

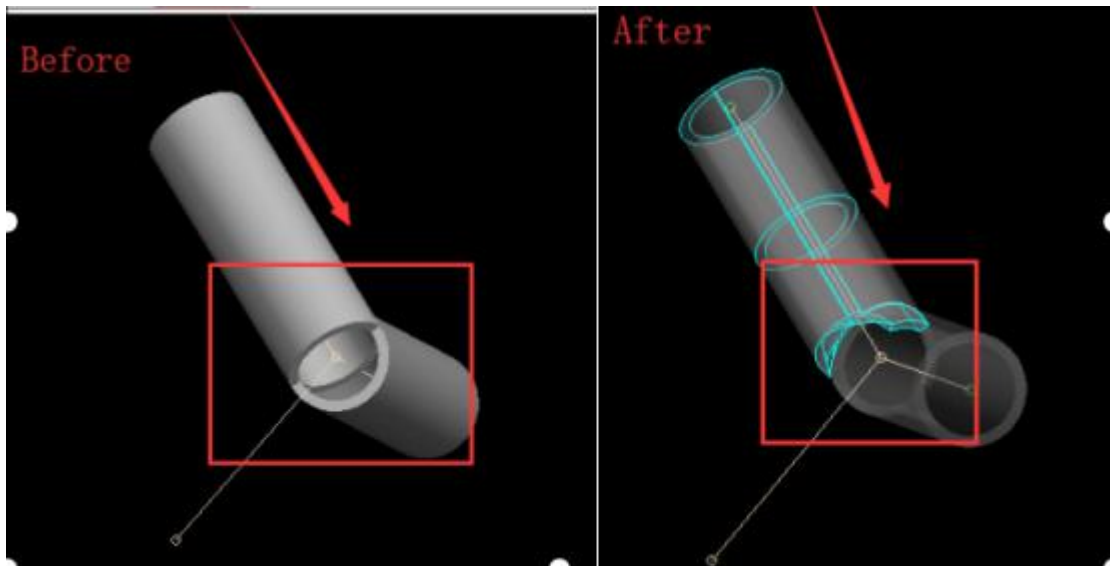
If you want to extend or shorten tube, you can input the length (positive value is for extension and negative value is for shortening).

Tube Type	Circular Tube
Trace NO.	2
Start Point Coordinate	
X	500.00
Y	-100.00
Z	0.00
End Point Coordinate	
X	500.00
Y	700.00
Z	0.00
Start Point Extend	
Length(1)	100.00
End Point Extend	
Length(1)	0.00
Confirm	
Cancel	

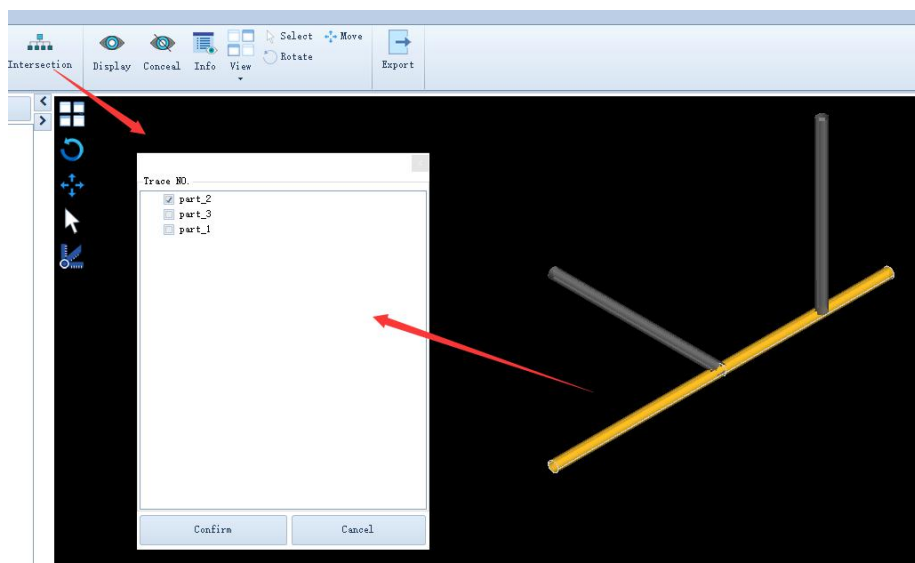




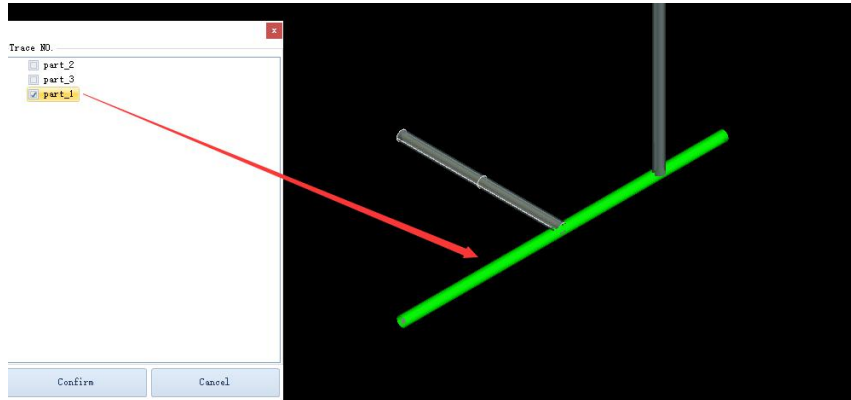
2.2.1.5 Intersection



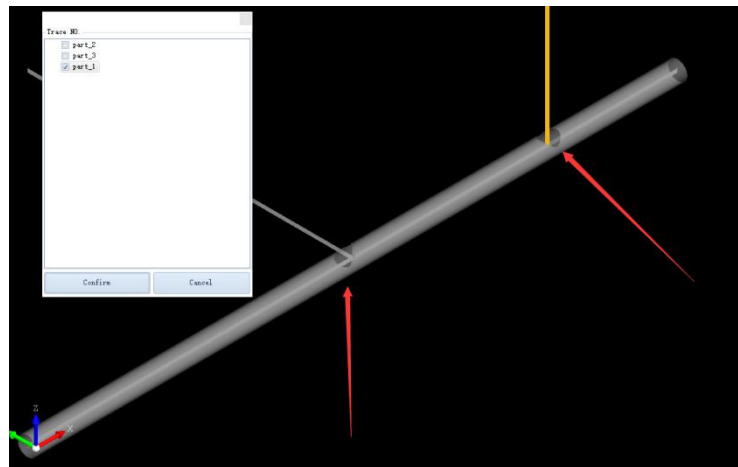
Step1: Choose the tubes.



Step 2: Choose the tube that need to generate, and the selected tube will become green.



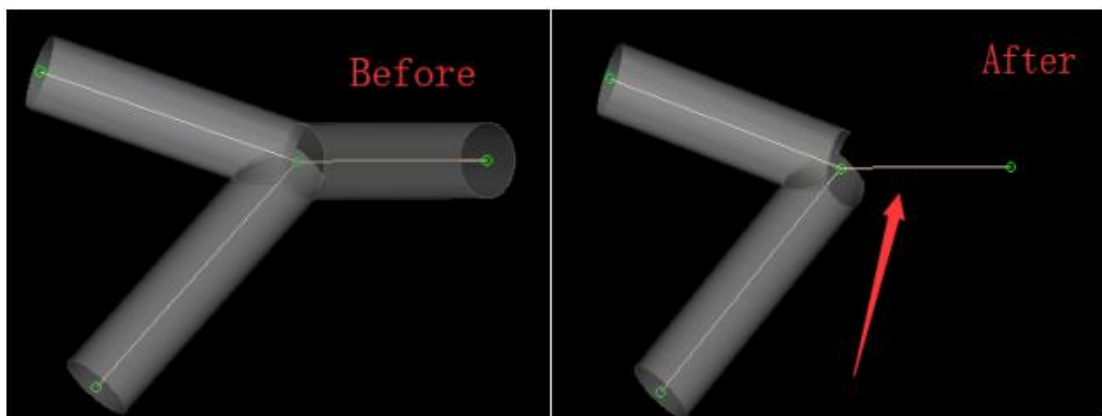
Step 3: Click "Confirm" and the tube will become translucent. The translucent tube is generated.



Step 4: Save the part or export to nest.

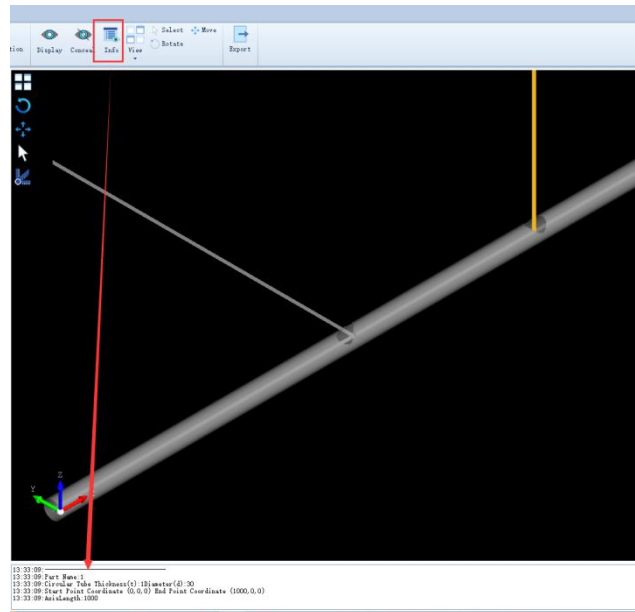
2.2.1.6 Display/ Conceal

In order to check the generated tube, the axis and parts can be selectively viewed. Just click "Display" to view the tube, "Conceal" will view the axis. Or double-click a part to switch the display of the axis and the tube.



2.2.1.7 Information

The information of the selected tube will display at the bottom of the software.



2.2.1.8 Export

The generated tube can be export to nest.

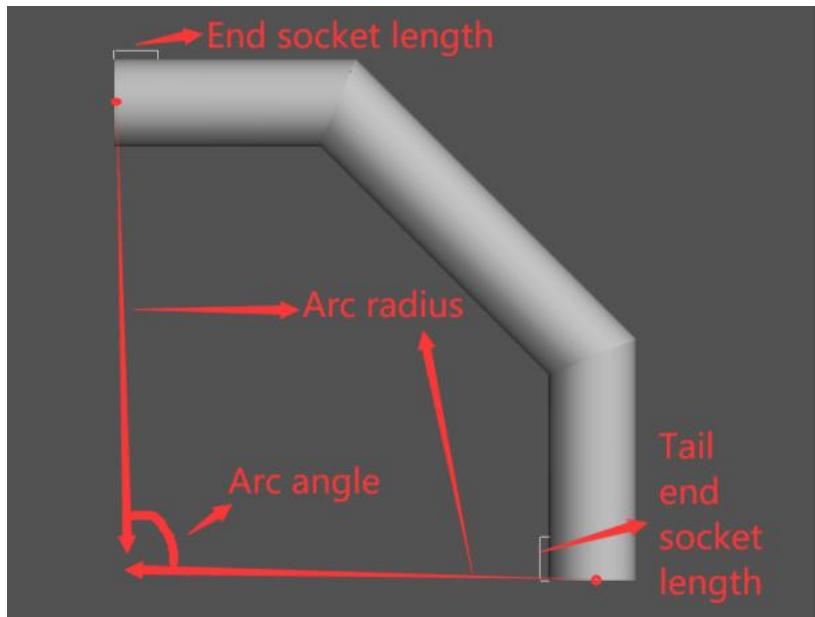
2.2.2 Node Model

2.2.2.1 Mitre bends

Users can set the parameters of mitre bends as needed. The mitre bends can be saved to local or export to nest.

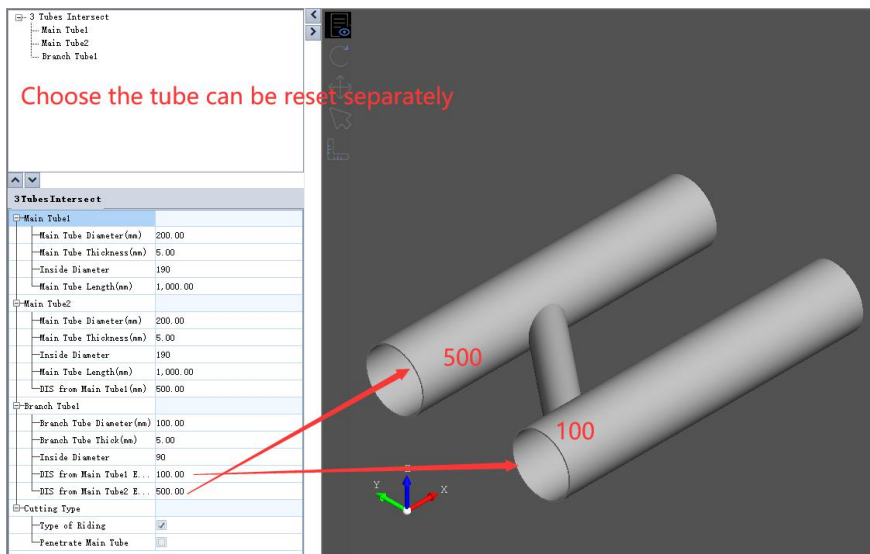
Arc radius: the distance between the center of the mitre and the center of the tube.

Mitre bends	
Parameter	
Tube diameter (mm)	100.00
Thickness(t) (mm)	10.00
Inside Diameter	80
Arc radius (mm)	500.00
Section number	3
Array Angle(°)	90.00
End socket length(mm)	50.00
Tail end socket lengt...	50.00



2.2.2.2 Three Tube Intersect

Users can set the parameters of the three tubes and the tubes can be saved or export to nest.



2.2.2.3 Circular Tube

This function performs intersecting operations on the circular tubes. Please set the parameters of the circular tube first.

Generate the main tube	
Parameter	
Main Tube Diameter(mm)	200.00
Main Tube Thickness(mm)	10.00
Inside Diameter	180
Main Tube Length(mm)	1,000.00

2.2.2.3.1 Main tube with Branch

Main tube with Branch: Generate the tube with branch.

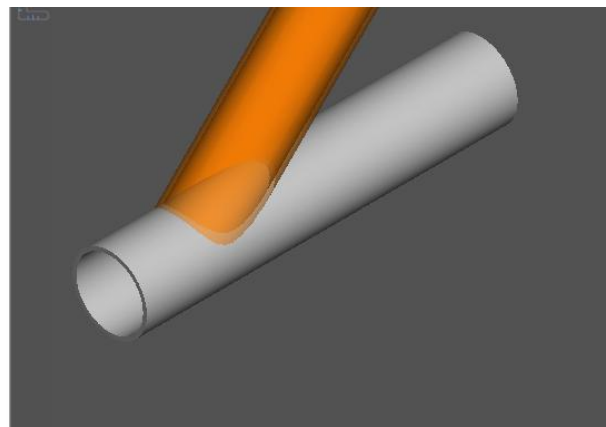
Type of riding: The circular hole projected on the main pipe from the inner line of the branch tube is used as the trace line.

Connection of inner and outer line: The track of the outer line of the branch pipe projected on the outer line of the main pipe was taken as the outer line track; and the track of the inner line of the branch pipe projected on the inner line of the main pipe was taken as the inner line track.

Penetrate main tube: The circular hole projected on the main pipe from the outer line of the branch tube is used as the trace line.

Rotation angle: The angle of rotation of the branch on X axis.

MainTubeWithBranch Sketch	
Cutting Type	
Type of Riding	<input checked="" type="checkbox"/>
Connection of Inner and O...	<input type="checkbox"/>
Penetrate Main Tube	<input type="checkbox"/>
Branch Tubel	
Branch Tube Diameter(mm)	180.00
Inside Diameter	160
Branch Tube Thick(mm)	10.00
Distance from the origin(mm)	200.00
Angle with Main Tube(°)	45.00
Rotation Angle(°)	90.00
Offset Distance(mm)	0.00



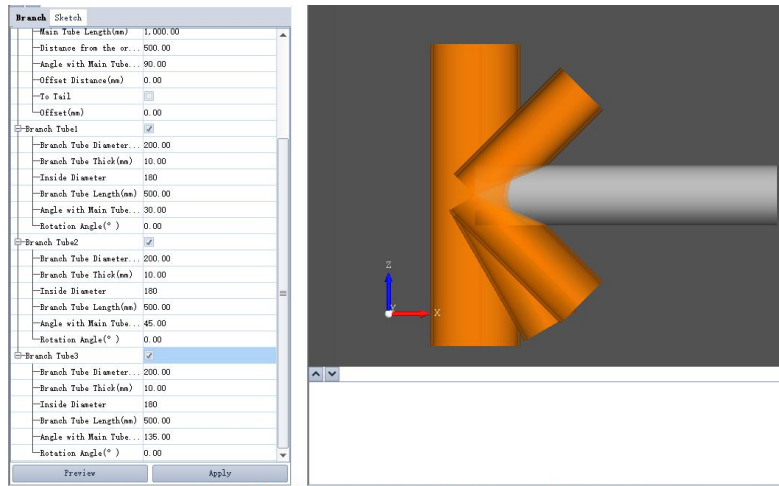
2.2.2.3.2 Branch

Branch: Generate the branch which is intersected with other tubes.

To tail: Users can process on the left or the right end.

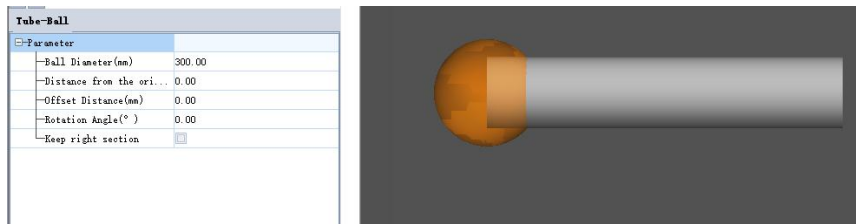
Central offset: The main tube will be offset on the direction of diameter.

Distance from origin: The main tube will be offset on the direction of X axis.



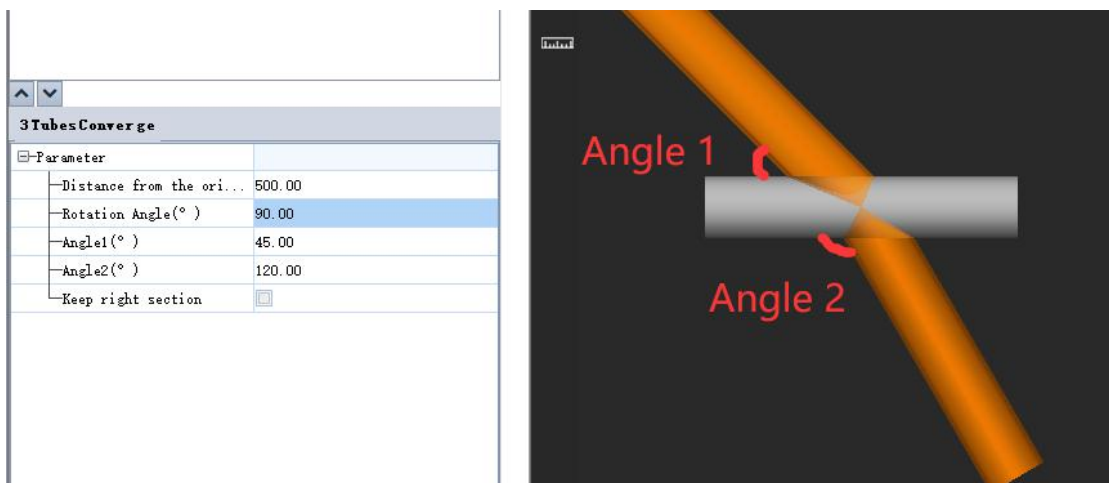
2.2.2.3.3 Tube-Ball

Tube-Ball: Generate the tube which is intersected with a ball.
Users can set the position of the ball to generate the tube.



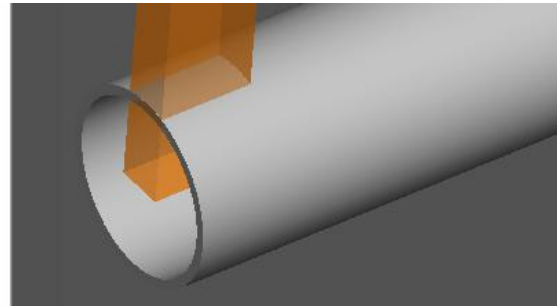
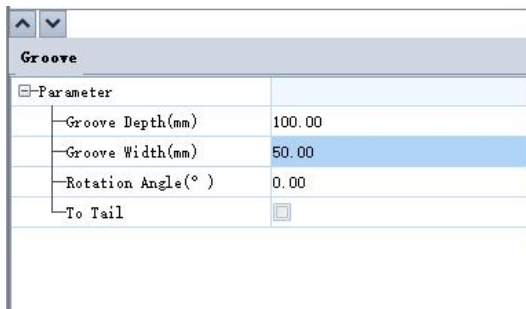
2.2.2.3.4 Three Tubes Converge

Three Tubes Converge: Generate the tube which is intersected other two tubes of the same diameter.



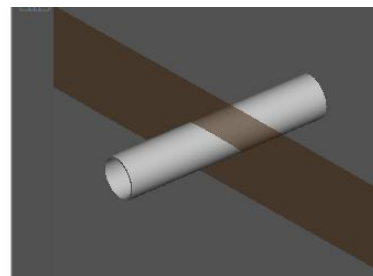
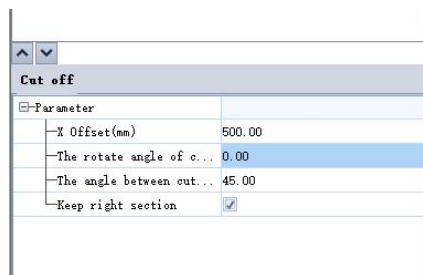
2.2.2.3.5 Groove

Groove: This function is to generate the grooves of the tube.



2.2.2.3.6 Cut off

Cut off: Users can cut off the tube at the appointed position. And users can choose to save the left or right part.



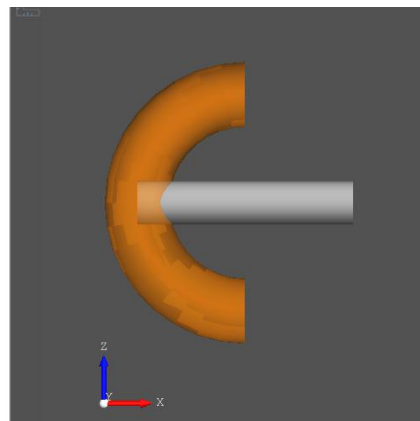
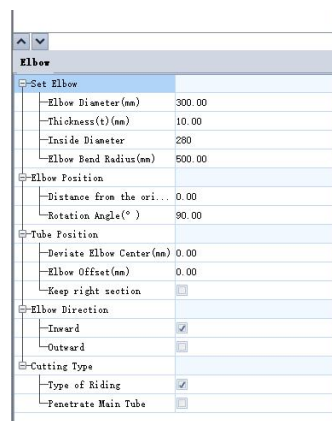
2.2.2.3.7 Elbow

Elbow: Generate the tube which is intersected with the elbow.

Elbow center offset: The parameter is used for the offset of the tube in the Y direction.

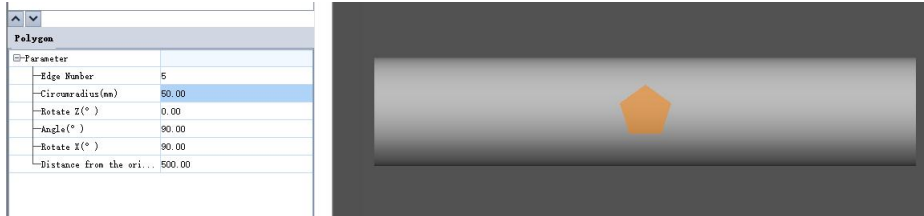
Elbow offset: The parameter is used for the offset of the tube in the Z direction.

Inward/Outward: The parameter is used for the orientation of the elbow.



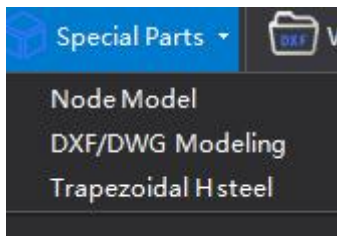
2.2.2.3.8 Polygon

Polygon:Generate the tube with the hole of polygon.If the hole is irregular, it is recommended to use the *wrap* function. Please refer to Section 2.2.



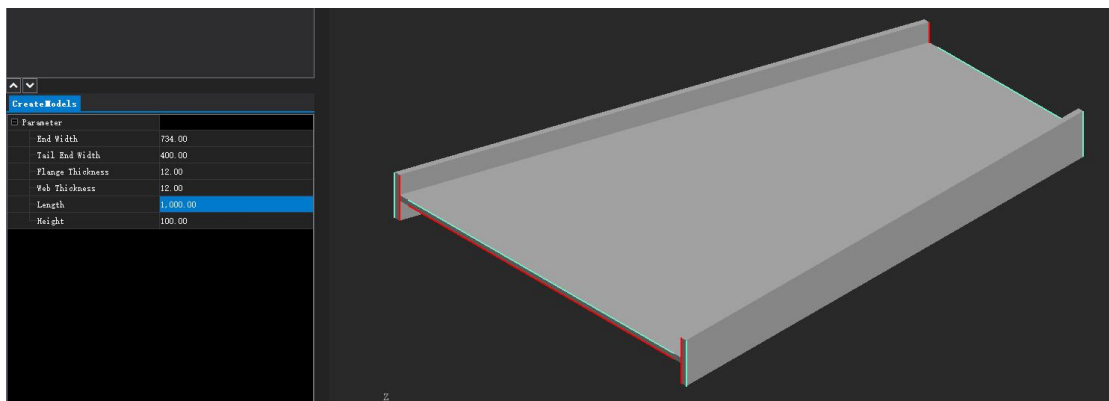
2.2.3 Trapezoidal H Shape

(2 axis does not support this function)



2.2.3.1 Create Model

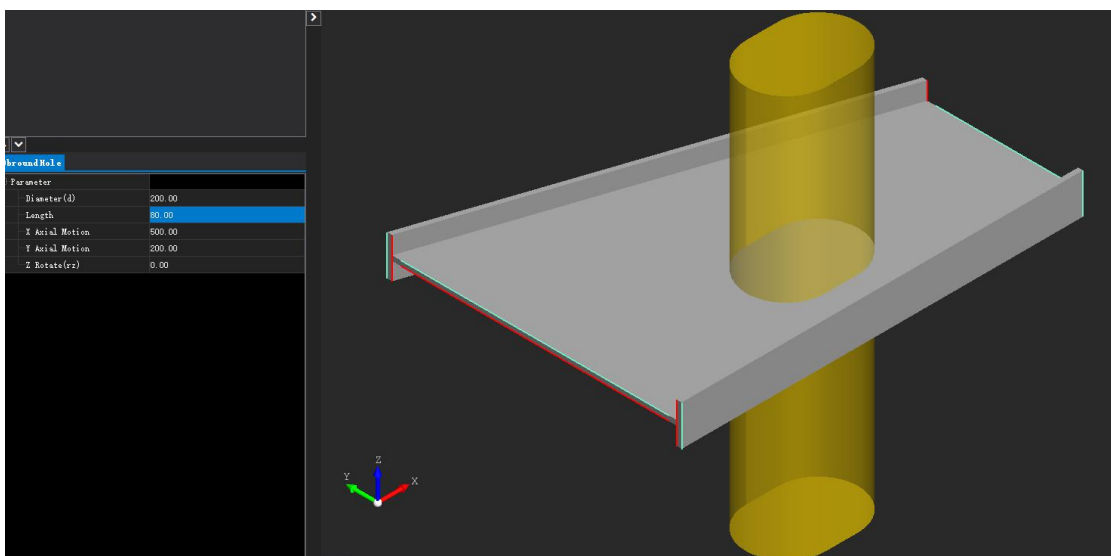
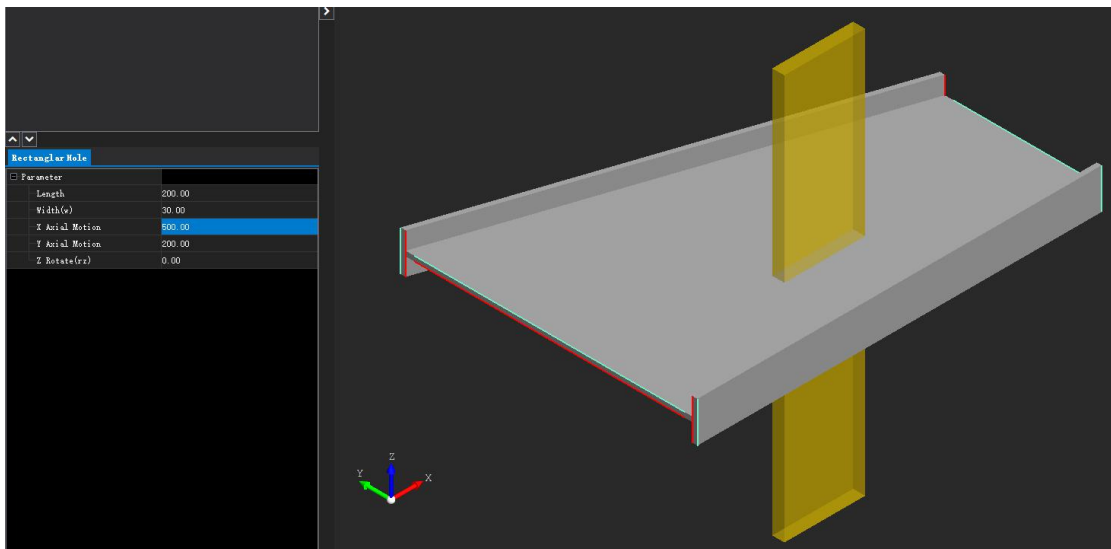
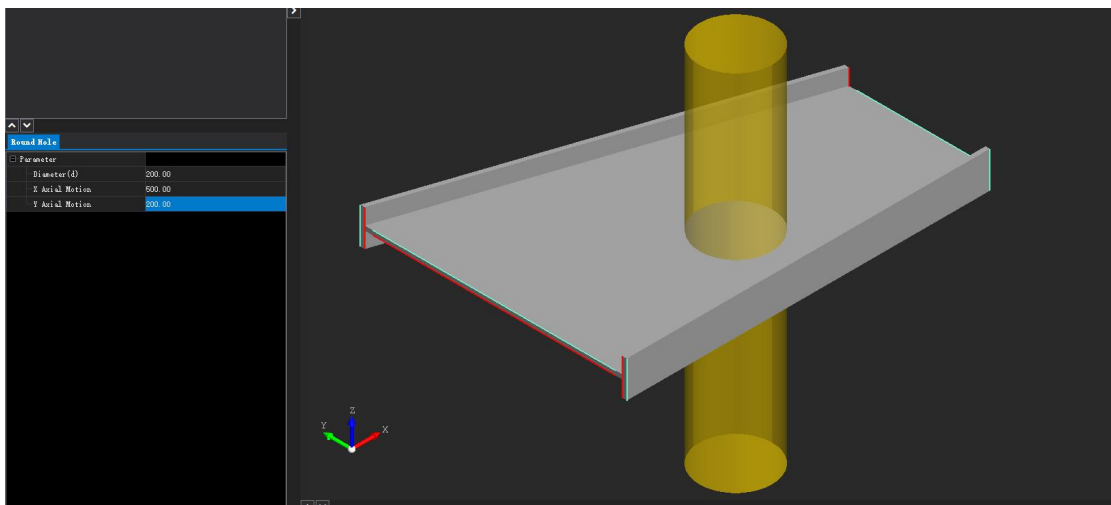
Users can generate the trapezoidal H shape steel by input the parameters as follows.

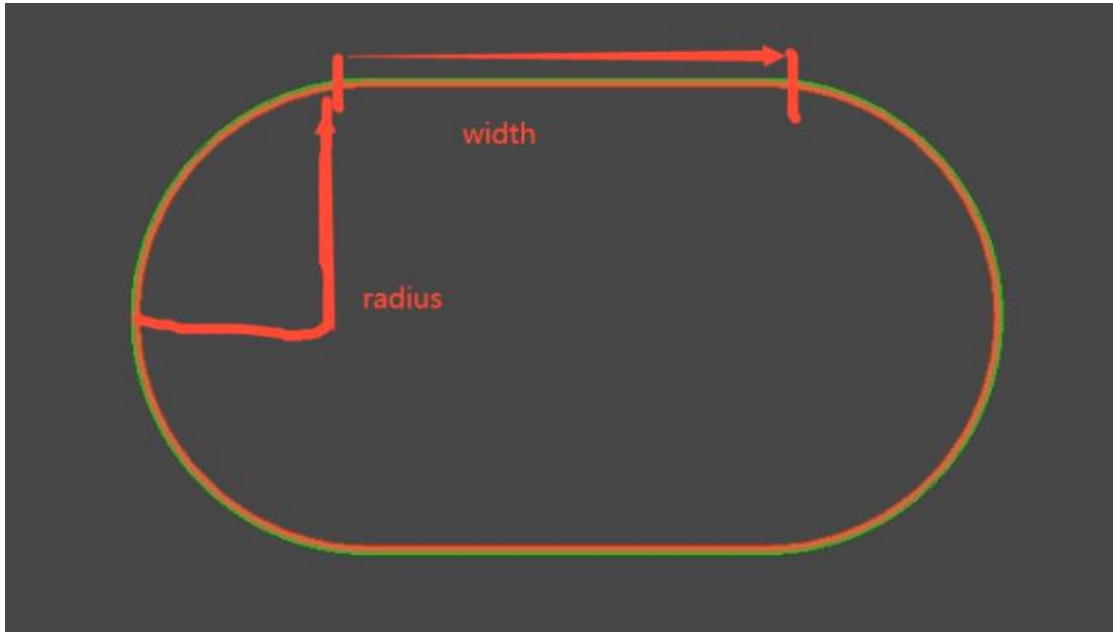


2.2.3.2 Opening

Users can make holes on it.

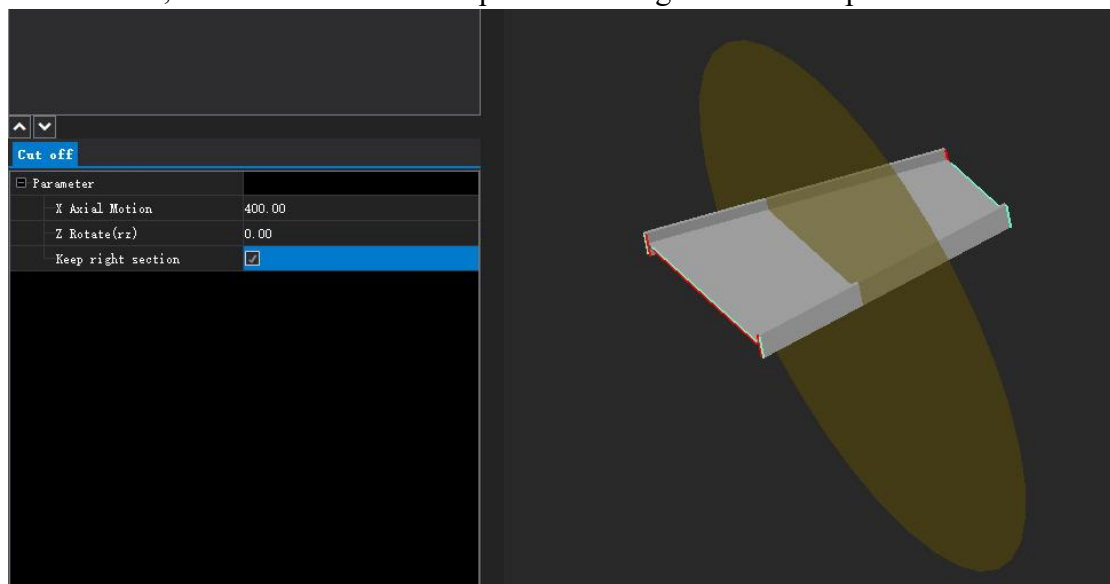
Round Hole Cut off Rectanglar Hole Obround Hole Tongue Shape





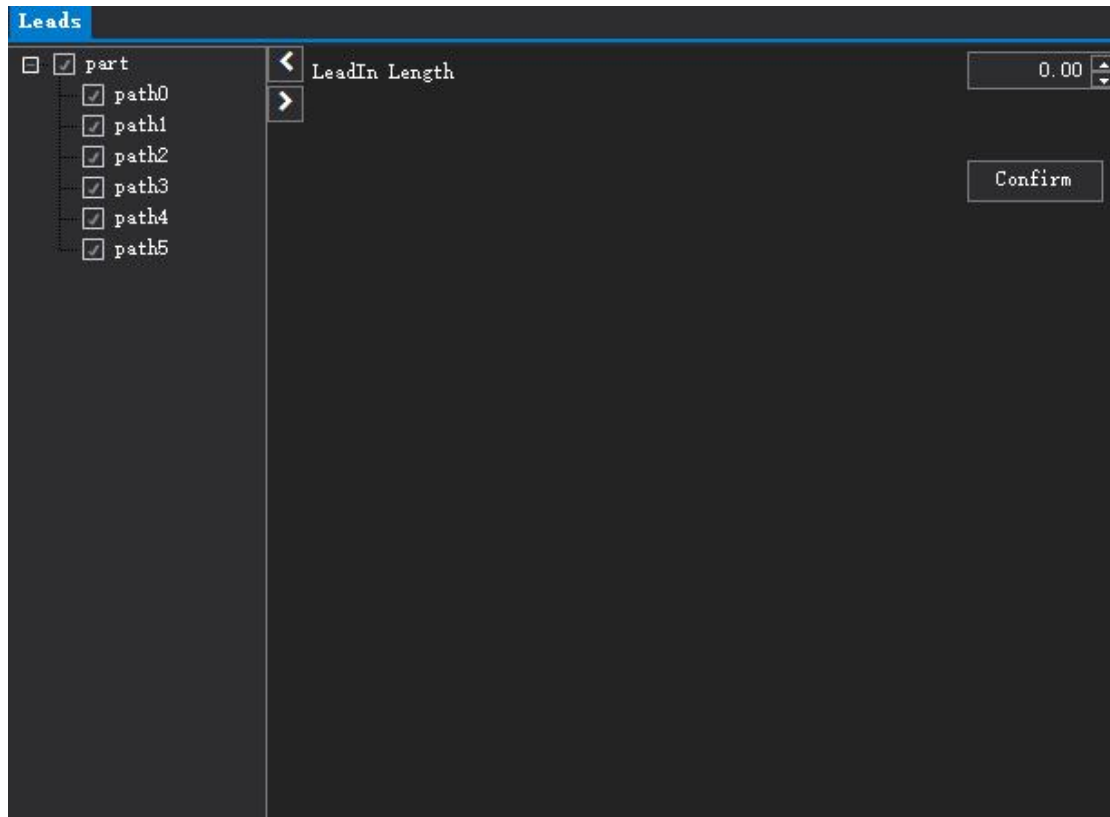
2.2.3.3 Cut off

Users can cut off parts according to their own needs. After inputting the position to be cut off, users can choose to keep the left or right side of the part.



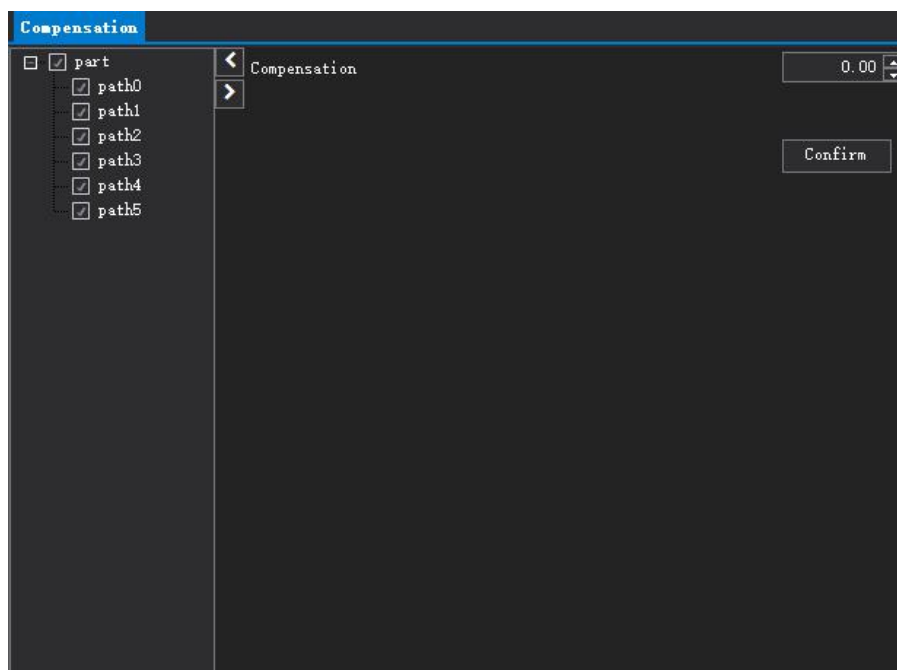
2.2.3.4 Leads

Users can set the length of the lead to the selected paths.



2.2.3.5 Compensation

The value of compensation can be set according to the requirements of the machine. Users can set the value to selected parts or to all parts.



2.2.3.6 Basic Parameter setting

Users can set the basic parameters as needed.

Parameter	
Model Precision	
Line Segment Length	5.00
Curve Segment Length	1.00
Safe Point Setting	
Gun Reach Protect Distance	20.00
Gun Reach Angle	30.00
Slant cutting distance	50.00
Distance from cutting point to swing gun axis	200.00
Security distance compensation	10.00
Distance to the bottom from the gun	500.00
Set Origin	
Y Axial Motion	0.00
z偏移距离	0.00

2.2.3.7 Code file setting

Users can set the axis name and axis direction according to the cutting machine.

Axis Type	Axis Name	Axis DIR
Feed Axis	X	+
Beam Axis	Y	+
Height A...	Z	+
Chuck Axis	A	+
SwingAlo...	B	+
SwingAlo...	C	-

2.2.3.8 Code

Users can generate the cutting code after generate the trapezoidal H shape steel.

```
part
├── path1
├── path2
├── path3
├── path4
├── path5
└── path6

(D=0)
(T=12)
(F=1,1000)
(SHAPE=2)
(W=734)
(H=100)
(R=0)
G71
G90
G92 X0 Y0 Z0 C0
G00 X0 Y0 Z-390 C0
G00 X0 Y0 Z-390 C0
G00 X0 Y-200 Z-390 C0
G00 X0 Y-200 Z-390 C-90
G00 X0 Y-200 Z-700 C-90
M07
G01 X0 Y-200 Z-695 C-90
G01 X0 Y-200 Z-690 C-90
G01 X0 Y-200 Z-685 C-90
G01 X0 Y-200 Z-680 C-90
G01 X0 Y-200 Z-675 C-90
G01 X0 Y-200 Z-670 C-90
G01 X0 Y-200 Z-665 C-90
G01 X0 Y-200 Z-660 C-90
```

确定

3.Import

3.1 Import file

The software supports to single/batch import stp/sj/igs files. (only support rectangular/circular tube igs file)

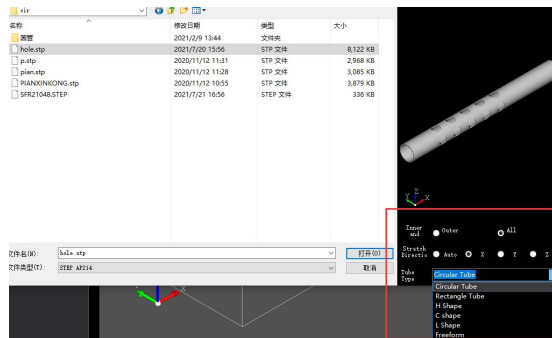
Rectangular/circular tube can be imported according to outer line or all lines, which can apply to the tube without inner line or the outer and inner lines are crossed.

A quick preview window is provided on the right side of the open dialog box to help you quickly find the file you need. Users can select the stretching direction and tube type according to the preview information.

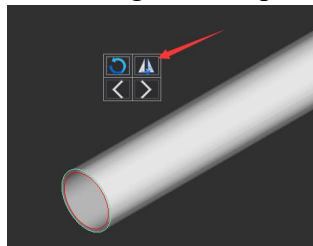
Note: Please make sure the stretching direction of the part is correct, otherwise the tube will be imported unsuccessfully.

If the stretching direction is not on X/Y/Z axis, you can choose “Auto” direction.

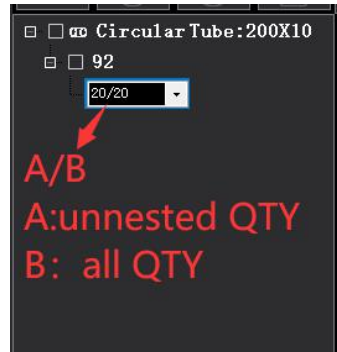
(2 axis only support import circular tube.)



Select the imported parts (including the freeform parts) in the display area to rotate or flip as needed to ensure the cutting face is up.



The profile and the size information of the tube will be displayed in the left side of the software after importing.



Notes for drawing in external software:

Circular Tube

1. Thickness must be bigger than 0mm.
2. The tube must be perfect circle, not ellipse-like.

Rectangle Tube

1. Make sure the Rectangle tube has four R Angle (90°) and that the chamfers are concentric.
2. The thickness of the four walls must be bigger than 0mm and consistent
3. Chamfer radius must be bigger than thickness.

H Shape

1. Make sure the four R Angle is 90° .
2. The thickness of the two flange is the same.
3. The web is in the middle

C Shape

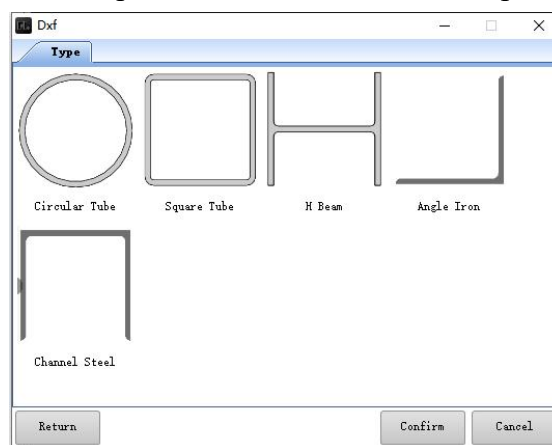
1. Two R angles are 90 degrees.

L Shape

1. The outline must be sharp.

3.2 Wrap import

The software support to import DXF/DWG file to create parts.



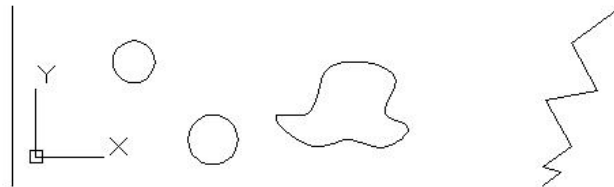
Take circular tube wrapping as an example (other tubes have similar operation steps)

Step 1: Drawing circular tube expansion graph.

There are two kinds of circular tube expansion graph:

With end line:Users need to draw circular tube expansion graph,including end line.

With end line



No end line:Users only need to draw the holes of the tube.

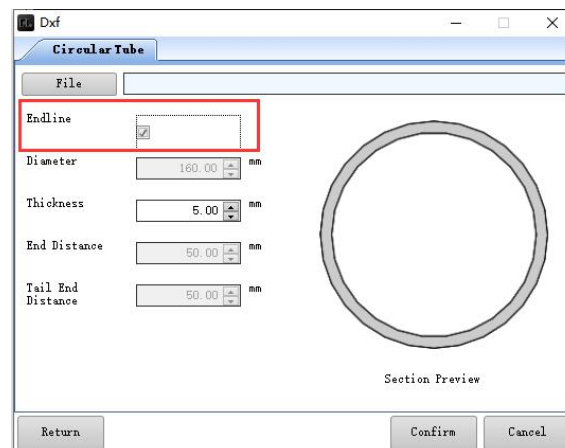
No end line



Step 2: Choose end line or not

With end line: Tick “Endline”

No end line:Not tick “Endline”



Step 3:Import DXF/DWG file

Please make sure the DXF/DWG file is closed

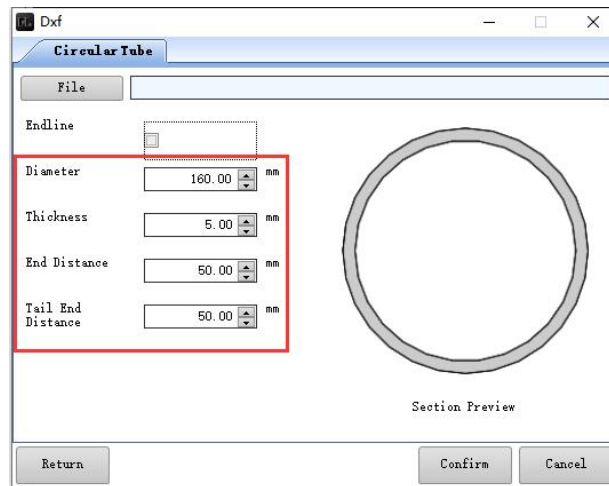
Step 4: Input parameters

With end line: Only need to input thickness.

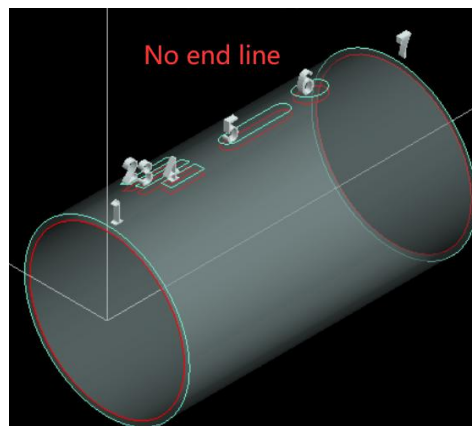
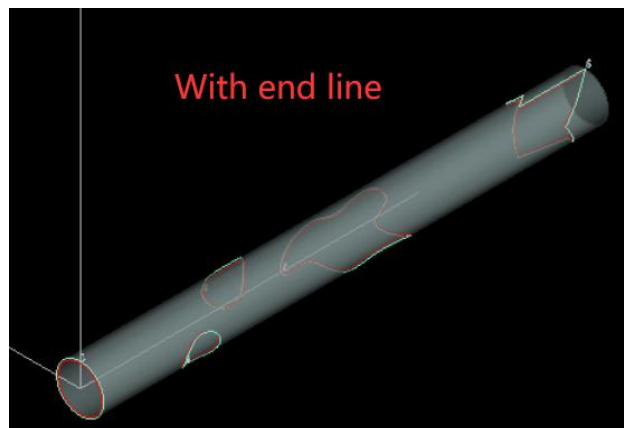
No end line: Input the diameter, thickness and the distance of the end.

End distance: The distance between the left-most opening shape and the left end.

Tail end distance: The distance between the right-most hole shape and the right end.

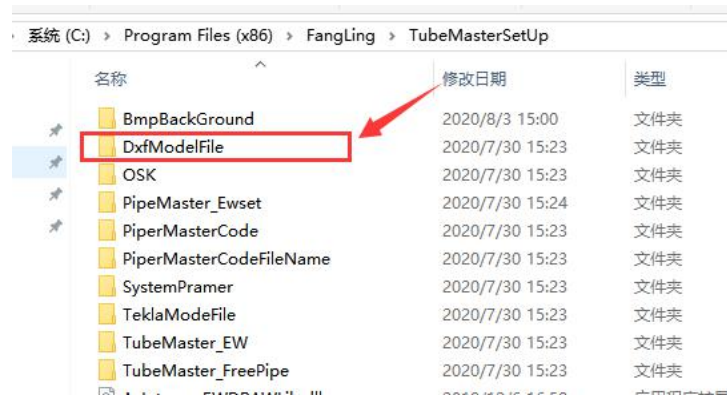


Step 5: Confirm
Effect:



DXF/DWG file Drawing requirements

The user can right click the software icon, and open the location of the file, and find the package drawing template “DxfModelFile”. There are DXF/DWG file templates of different tubes for users’ reference.



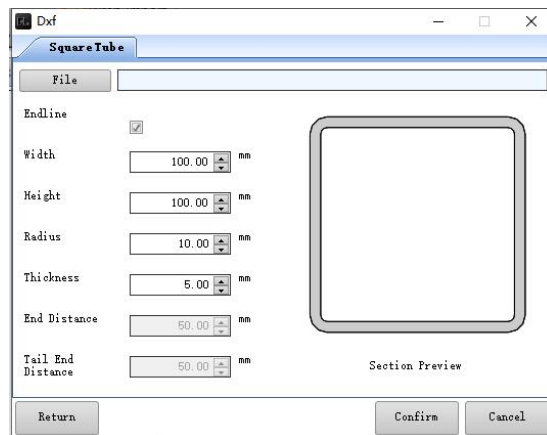
Wrap drawing requirements:

Circular Tube:

- With end line: Calculate the length and draw end lines. The software will calculate the diameter of the circular tube automatically.
- No end line: Only need to draw the holes of the tube. Users need to input the diameter, thickness and the distance of the end.

Rectangle Tube:

- With end line: Calculate the length (including R angle) and draw end lines. Users need to input the width, height, radius and thickness.
- No end line: Only need to draw the holes of the tube. Users need to input the width, height, radius, thickness and the distance of the end.



H Shape:

- Users can draw H Shape wrap DXF/DWG file according to the template provided by the software (“DxfModelFile”).
- Change the parameter as needed and the software will identify the date automatically.
- There are three colors (yellow/green/blue) corresponding to the left flange/ web/ right flange.
- The flanges and the web can be separable. It doesn't have to be drawn together. The software can read the information according to the colors.

H钢模板HBeam
&长度Length:2700
&宽度Width:320
&高度Height:200
&拐角半径Radius:10
&翼板壁厚FlangeThickness:10
&腹板壁厚WebThickness:5



C Shape:

- Users can draw the wrap DXF/DWG file according to the template provided by the software (“DxfModelFile”).
- Change the parameter as needed and the software will identify the date automatically.
- There are three colors (yellow/green/blue) corresponding to the left flange/ web/ right flange.
- The flanges and the web can be separable. It doesn't have to be drawn together. The software can read the information according to the colors.

槽钢模板Channel
&长度Length:2700
&宽度Width:320
&高度Height:200
&翼板壁厚FlangeThickness:10
&腹板壁厚WebThickness:5



L Shape:

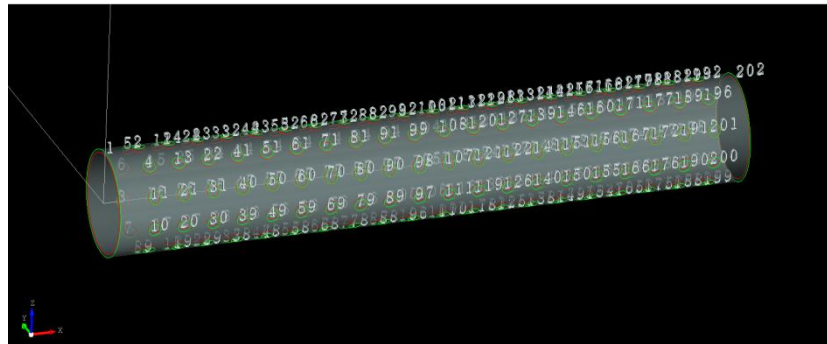
- Users can draw the wrap DXF/DWG file according to the template provided by the software (“DxfModelFile”).
- Change the parameter as needed and the software will identify the date automatically.
- There are two colors (green/blue) corresponding to the two flanges.
- It doesn't have to be drawn together. The software can read the information according to the colors.

角钢模板AngleIron
&长度Length:2700
&宽度Width:200
&高度Height:200
&翼板壁厚FlangeThickness:10

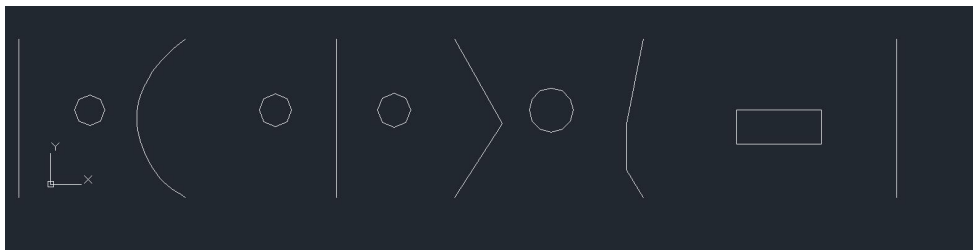


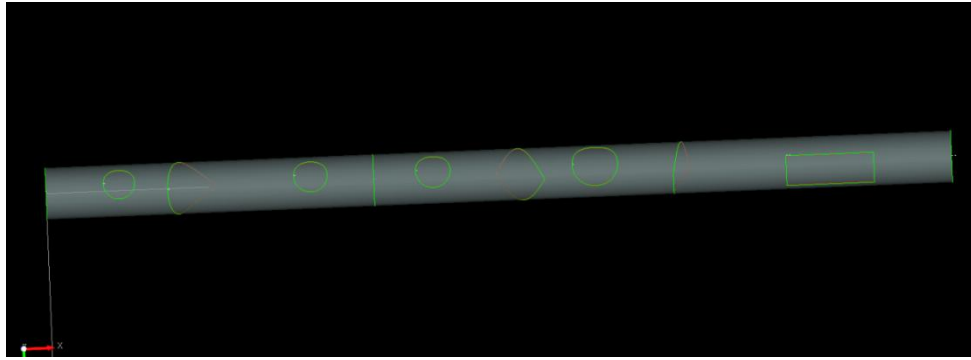
Case

1. Porous model

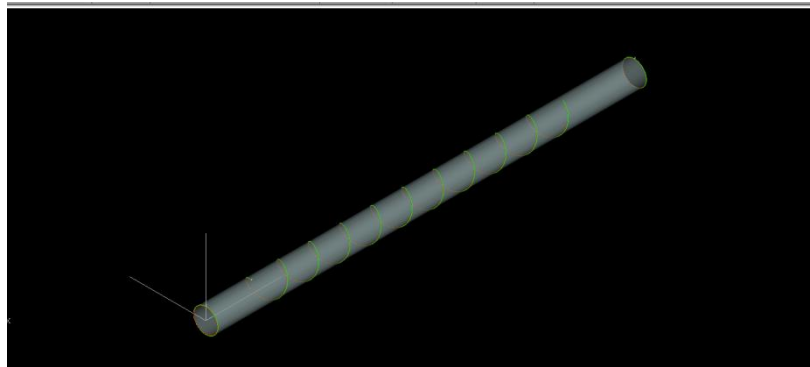
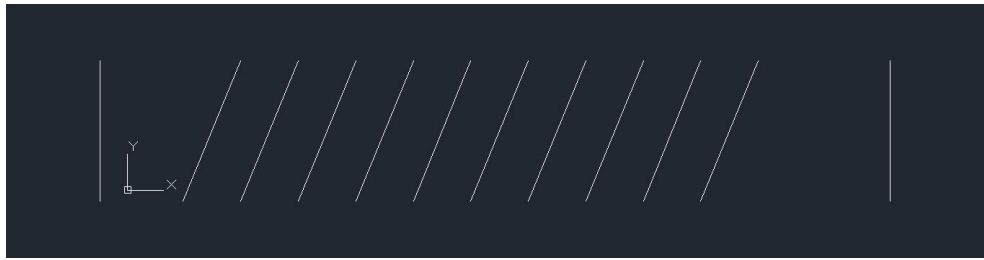


2. Multiple end cuts and openings





3. Helix on Cir tube



4.Process setting

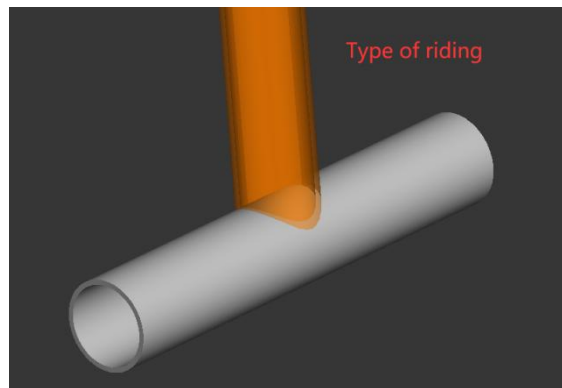
4.1 Part expansion

The part can be expanded to 2D expansion diagram which is convenient for users to check.

Each path can be set bevel, leads and compensation, and other parameters separately. The selected path will be highlighted.

Cutting type: Riding&Penetrating only works on the end cutting. It does not work on the holes.

- Riding: It cuts the inner line of the tube end line. The outer line is calculated according to the inner line. It is for two tubes welding.
- Penetrating: It cuts the outer line of the tube end line. The inner line is calculated according to the outer line. It is used to insert a branch tube into a main tube.
- Constant bevel: The bevel angle is constant, which is suggested to use in the ride type.
- According to outer contour: The outer contour will be the cutting line.



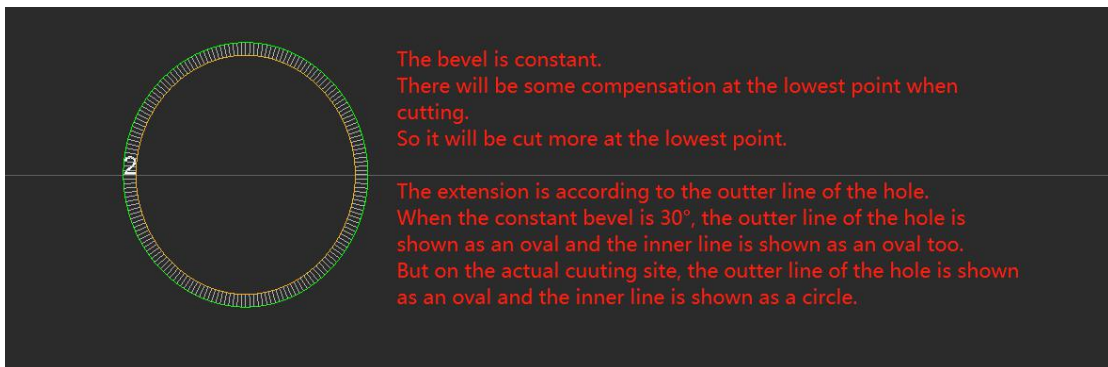
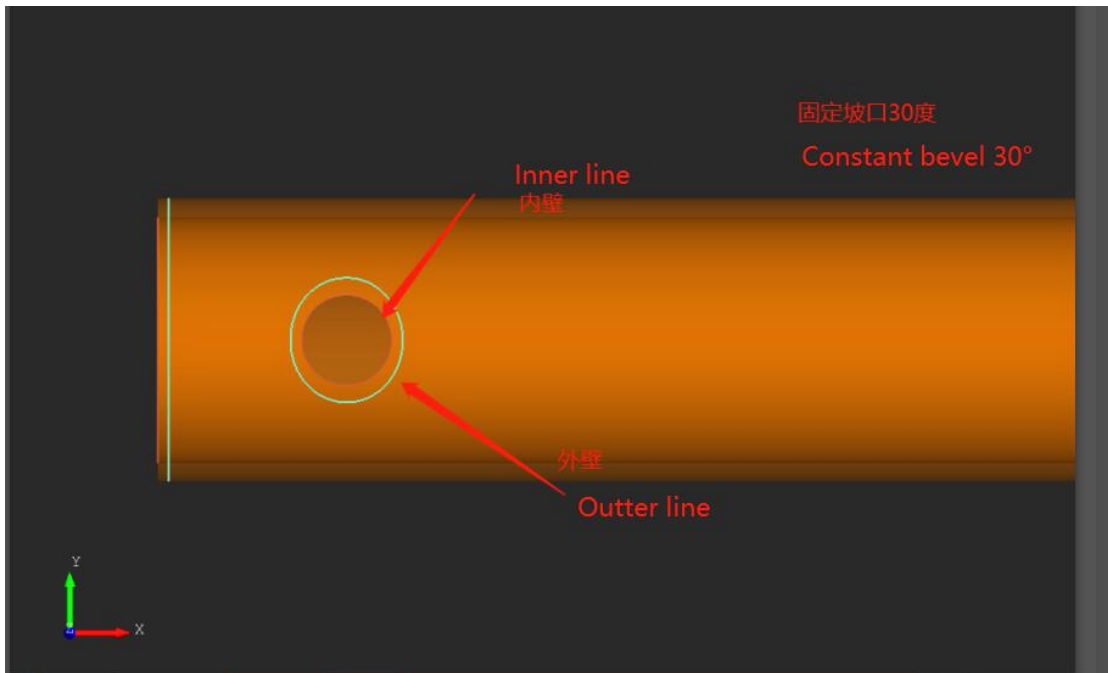
The bevel is constant.

There will be some compensation at the lowest point when cutting.
So it will be cut more at the lowest point.

The extension is according to the outer line of the hole.

When the constant bevel is 30° , the outer line of the hole is shown as an oval and the inner line is shown as an oval too.

But on the actual cutting site, the outer line of the hole is shown as an oval and the inner line is shown as a circle.



- Dynamic bevel: The bevel angle is dynamic, which is suggested to use in the type of combination or the tube intersects the plate.

The bevel is dynamic.

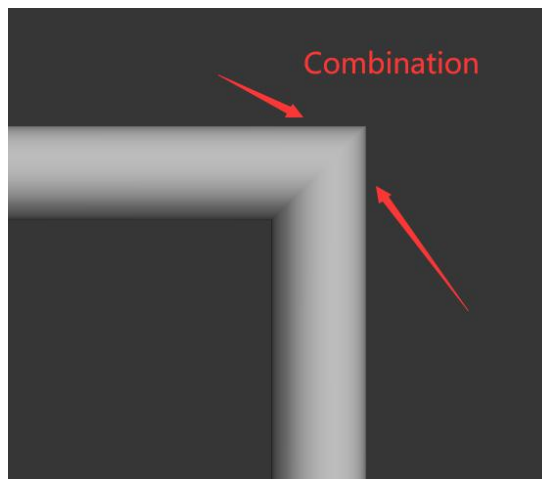
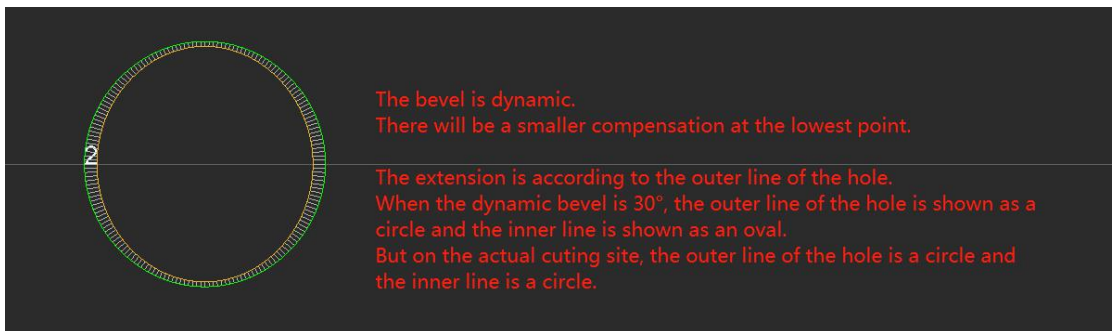
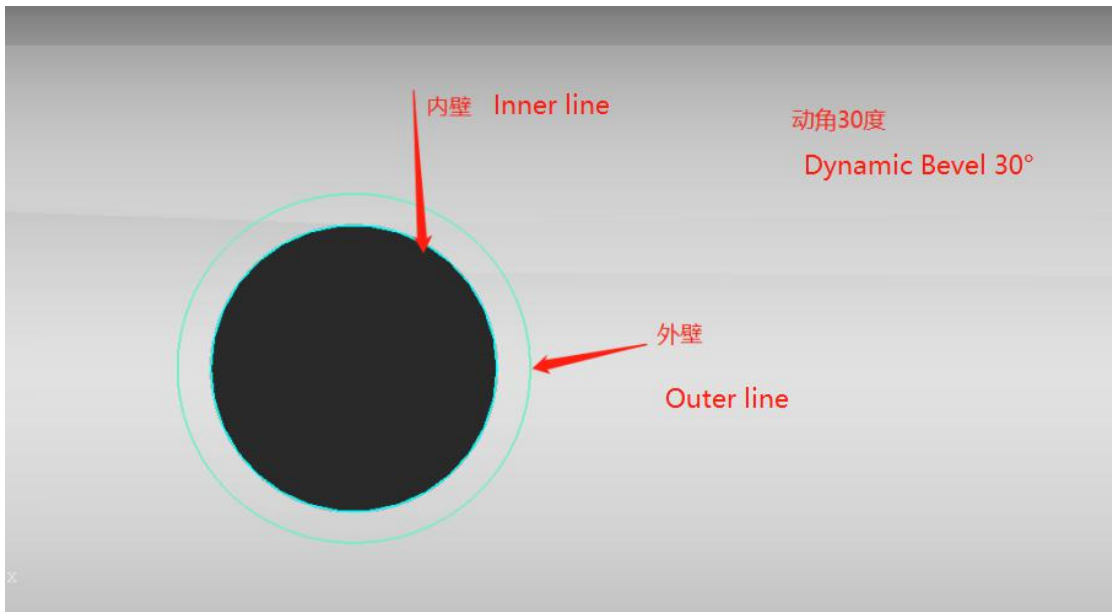
There will be a smaller compensation at the lowest point.

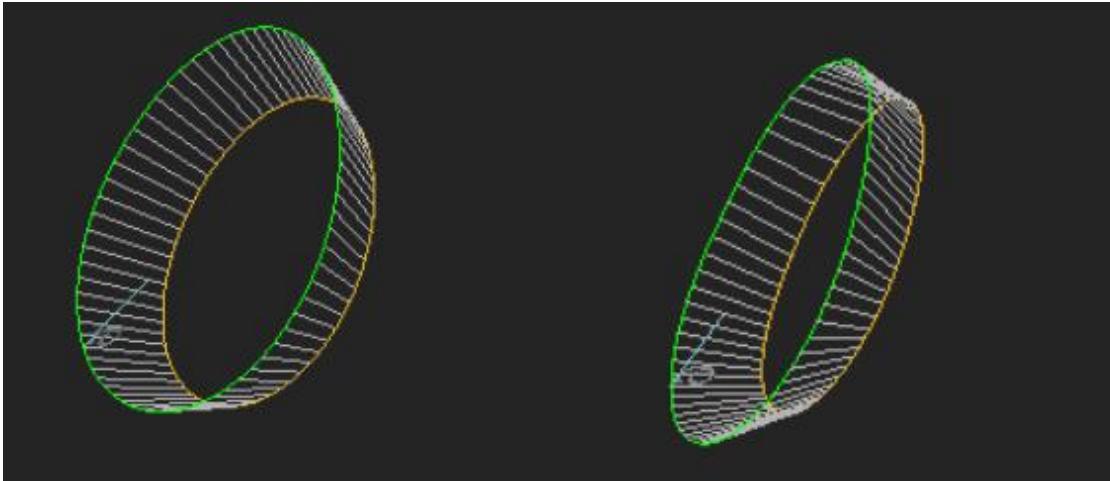
The extension is according to the outer line of the hole.

When the dynamic bevel is 30° , the outer line of the hole is shown as a circle and the inner line is shown as an oval.

But on the actual cutting site, the outer line of the hole is a circle and the inner line

is a circle.

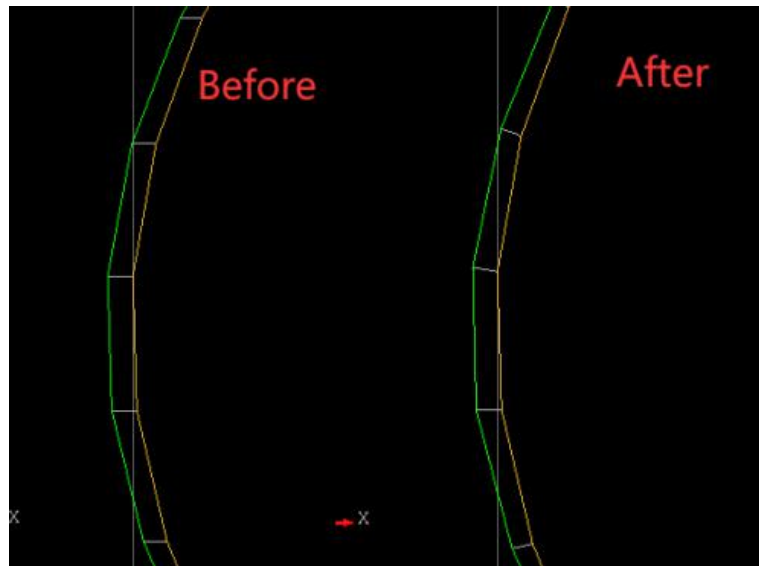




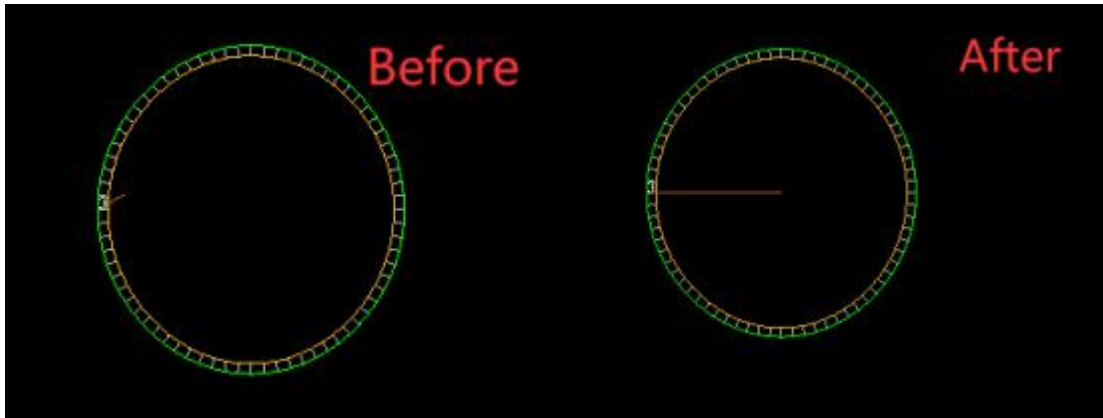
Constant bevel 25°

Dynamic bevel 25°

- Notch bevel: the slot can be set bevel separately (only constant bevel).
- C Slope: Slope surface will be enlarged.



- Compensation: It can prevent the length of cutting parts from becoming shorter or the holes from becoming larger due to the slit width.
- Leads: Prevent notches during cutting.
There are three leads type: line/slash/arc.
Users can set the lead in or the lead out line as needed.
Start Point at Hole Center: The start point will be arranged in the center of the hole.

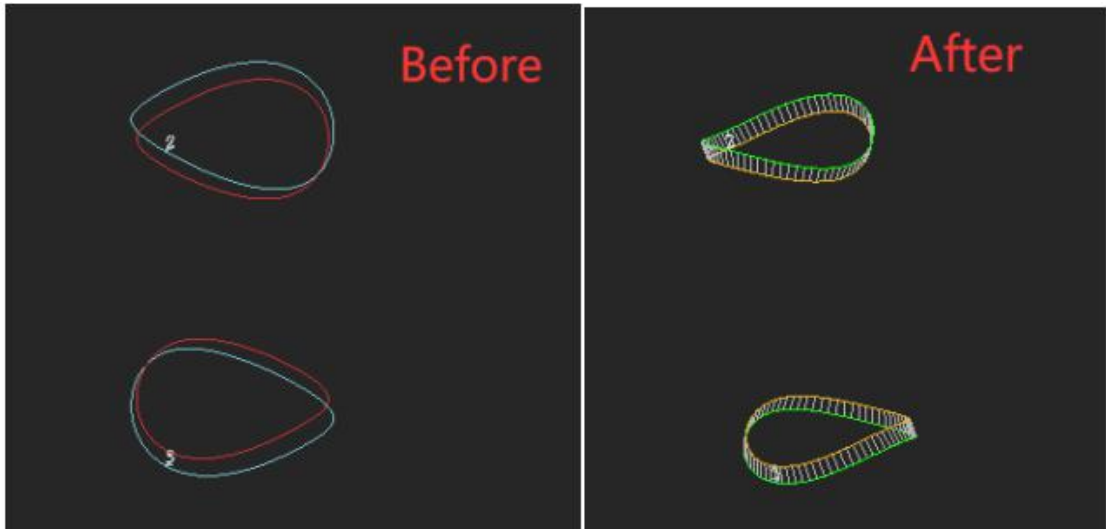


- Slotting Width: When the cutting gun swings, the slit width will lead to slight error deviation of the trajectory. This parameter is used to compensate for the cut size and is generally set within 2mm.
- Cutting More: The default state is checked. It can avoid the interference of parts.
- L-shaped Cutting Compensation: It is applied to rectangle/H shape/C shape/L shape tube with constant bevel. This function will deviate the trajectory automatically to cut off the tube. (can not apply to circular tube)



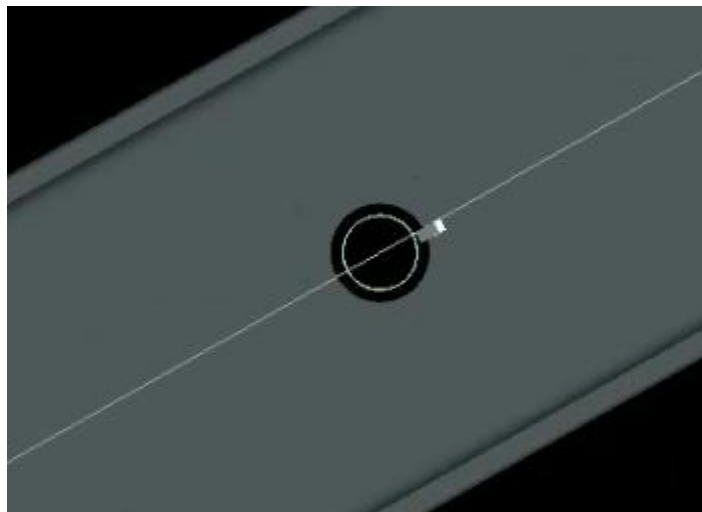
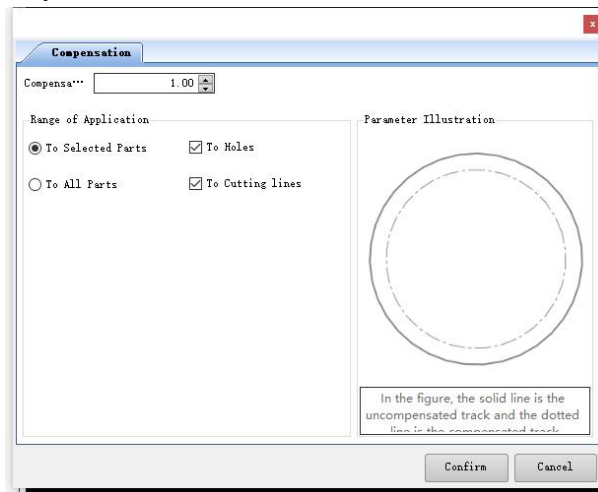
- Speed: some path need set speed separately.
- Ellipse-Circle: Round hole will be a little elliptical in the actual cutting, due to the rotation of the chuck. You can set X/Y offset to deal with it.
- Display connector: Connection lines will display a better indication of bevel and the gesture of the cutting gun.

Display
Connector



3.2 Compensation

The value of compensation can be set according to the requirements of the machine. The user can set the value to selected parts or to all parts. Holes and cutting lines can be set separately.



3.3 Start point

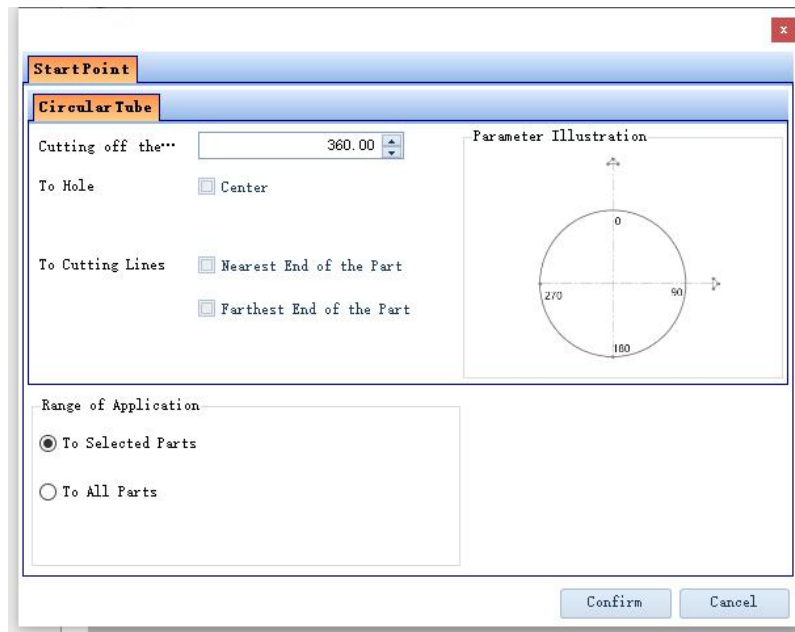
The start point can be set to selected parts or to all parts.

90° : The positive Y-axis 180° :The negative Z-axis

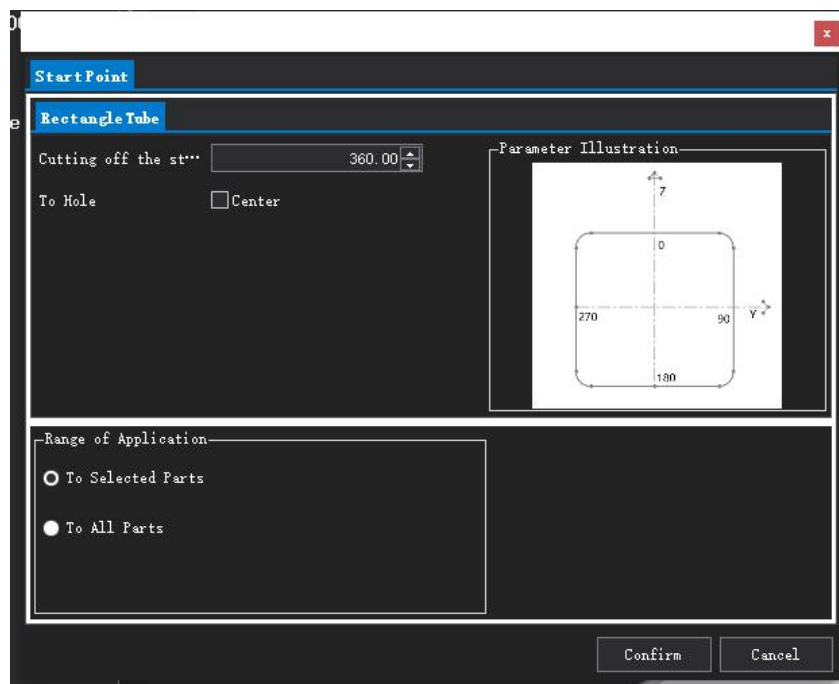
270° :The negative Y-axis 0° (360°) :The positive Z-axis

The start point can set to hole (center) or cutting lines(nearest end/ farthest end).

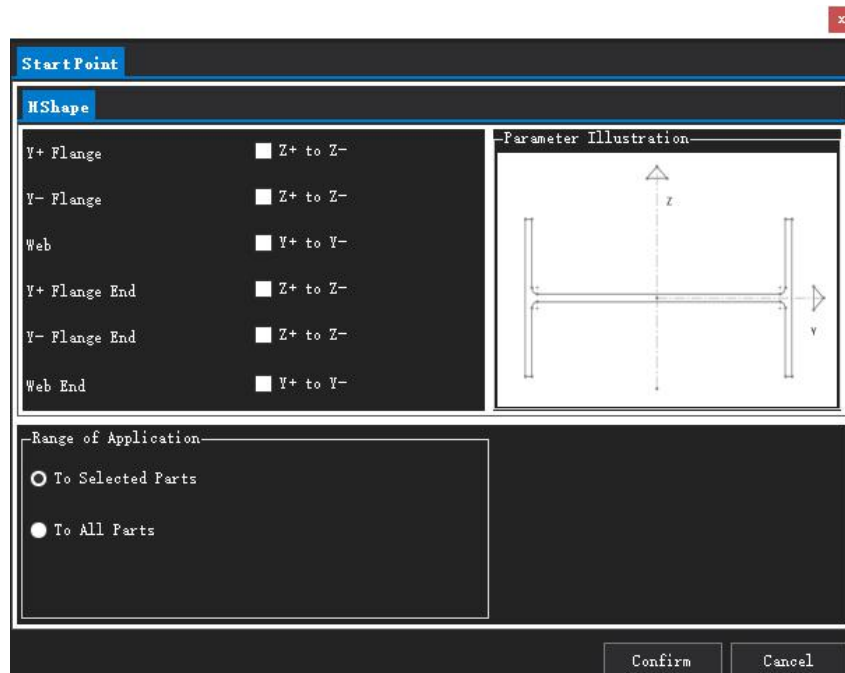
Start point parameters for circular/oval/obround tube:



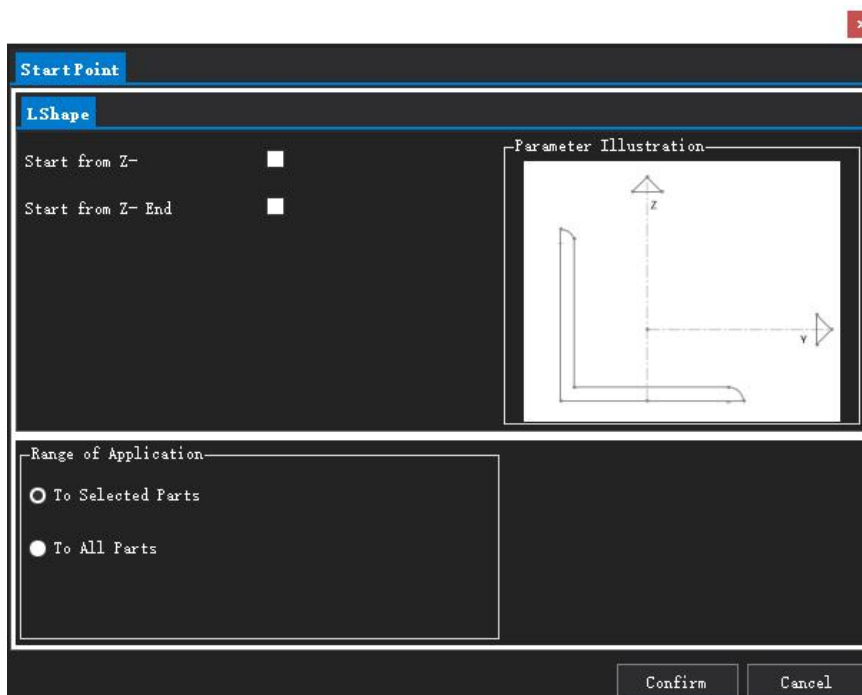
Start point parameters for rectangular tube:



Start point parameters for H/C Shape tube:

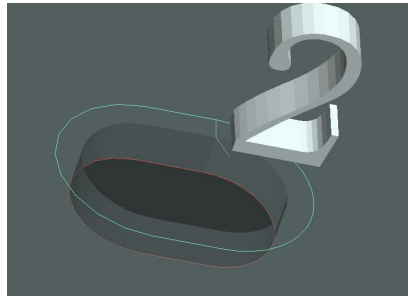
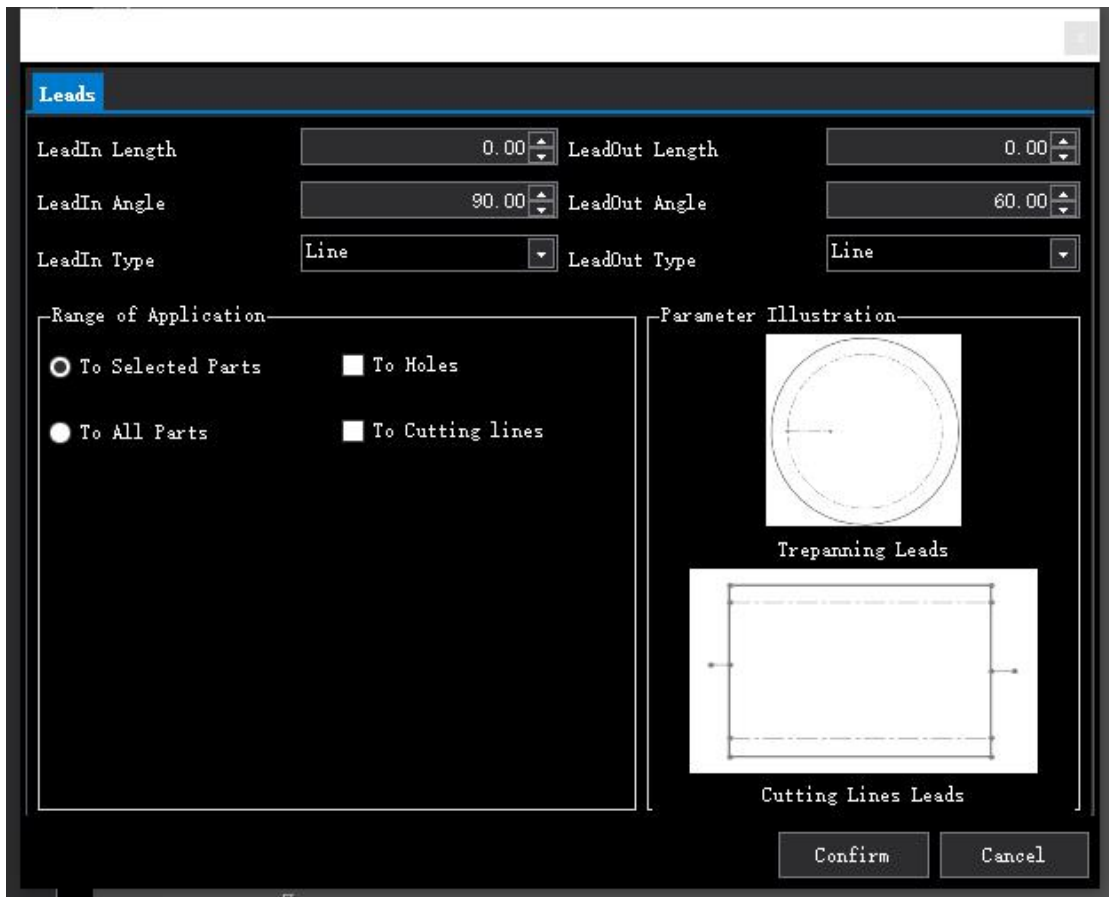


Start point parameters for L Shape tube:



3.4 Leads

The user can set the length/angle of the leads to the selected parts or to all parts. Holes and cutting lines can be added leads separately.



3.5 Vertical intersect hole

Vertical intersect hole setting can only set on circular tube.

Code difference:

Aperture(Vertical intersect hole): The value of A axis(Chuck) is constant.

Round hole: The value of A axis(Chuck) is different.

```

(-----path:2-----)
G00 X180.158 Y2.64 Z199.983 A360 B0 C0 F800
M07
G01 X181.406 Y7.753 Z199.85 A360 B0 C0 F800
G01 X183.821 Y12.376 Z199.617 A360 B0 C0 F800
G01 X187.251 Y16.22 Z199.341 A360 B0 C0 F800
G01 X191.481 Y19.047 Z199.091 A360 B0 C0 F800
G01 X196.25 Y20.679 Z198.928 A360 B0 C0 F800
G01 X201.257 Y21.011 Z198.893 A360 B0 C0 F800
G01 X206.183 Y20.021 Z198.995 A360 B0 C0 F800
G01 X210.719 Y17.774 Z199.209 A360 B0 C0 F800
G01 X214.579 Y14.412 Z199.48 A360 B0 C0 F800
G01 X217.525 Y10.145 Z199.743 A360 B0 C0 F800
G01 X219.371 Y5.239 Z199.931 A360 B0 C0 F800
G01 X220 Y0 Z200 A360 B0 C0 F800
G01 X219.371 Y-5.239 Z199.931 A360 B0 C0 F800
G01 X217.525 Y-10.145 Z199.743 A360 B0 C0 F800
G01 X214.579 Y-14.412 Z199.48 A360 B0 C0 F800
G01 X210.719 Y-17.774 Z199.209 A360 B0 C0 F800
G01 X206.183 Y-20.021 Z198.995 A360 B0 C0 F800
G01 X201.257 Y-21.011 Z198.893 A360 B0 C0 F800
G01 X196.25 Y-20.679 Z198.928 A360 B0 C0 F800
G01 X191.481 Y-19.047 Z199.091 A360 B0 C0 F800
G01 X187.251 Y-16.22 Z199.341 A360 B0 C0 F800
G01 X183.821 Y-12.376 Z199.617 A360 B0 C0 F800
G01 X181.406 Y-7.753 Z199.85 A360 B0 C0 F800
G01 X180.158 Y-2.64 Z199.983 A360 B0 C0 F800
M08
(-----endpath:2-----)

(-----path:4-----)
G00 X450.063 Y0 Z200 A180.755 B0 C0 F800
M07
G01 X450.563 Y0 Z200 A182.257 B0 C0 F800
G01 X451.558 Y0 Z200 A183.737 B0 C0 F800
G01 X453.034 Y0 Z200 A185.18 B0 C0 F800
G01 X454.976 Y0 Z200 A186.571 B0 C0 F800
G01 X457.36 Y0 Z200 A187.899 B0 C0 F800
G01 X460.162 Y0 Z200 A189.15 B0 C0 F800
G01 X463.355 Y0 Z200 A190.314 B0 C0 F800
G01 X466.907 Y0 Z200 A191.377 B0 C0 F800
G01 X470.788 Y0 Z200 A192.332 B0 C0 F800
G01 X474.96 Y0 Z200 A193.166 B0 C0 F800
G01 X479.386 Y0 Z200 A193.872 B0 C0 F800
G01 X484.025 Y0 Z200 A194.44 B0 C0 F800
G01 X488.832 Y0 Z200 A194.863 B0 C0 F800
G01 X493.756 Y0 Z200 A195.135 B0 C0 F800
G01 X498.748 Y0 Z200 A195.253 B0 C0 F800
G01 X503.753 Y0 Z200 A195.213 B0 C0 F800
G01 X508.718 Y0 Z200 A195.018 B0 C0 F800
G01 X513.589 Y0 Z200 A194.67 B0 C0 F800
G01 X518.318 Y0 Z200 A194.174 B0 C0 F800
G01 X522.856 Y0 Z200 A193.536 B0 C0 F800
G01 X527.16 Y0 Z200 A192.765 B0 C0 F800
G01 X531.191 Y0 Z200 A191.869 B0 C0 F800
G01 X534.912 Y0 Z200 A190.859 B0 C0 F800
G01 X538.288 Y0 Z200 A189.744 B0 C0 F800
G01 X541.29 Y0 Z200 A188.535 B0 C0 F800
G01 X543.886 Y0 Z200 A187.244 B0 C0 F800
G01 X546.052 Y0 Z200 A185.883 B0 C0 F800
G01 X547.763 Y0 Z200 A184.464 B0 C0 F800
G01 X549.001 Y0 Z200 A183.001 B0 C0 F800
G01 X549.748 Y0 Z200 A181.508 B0 C0 F800

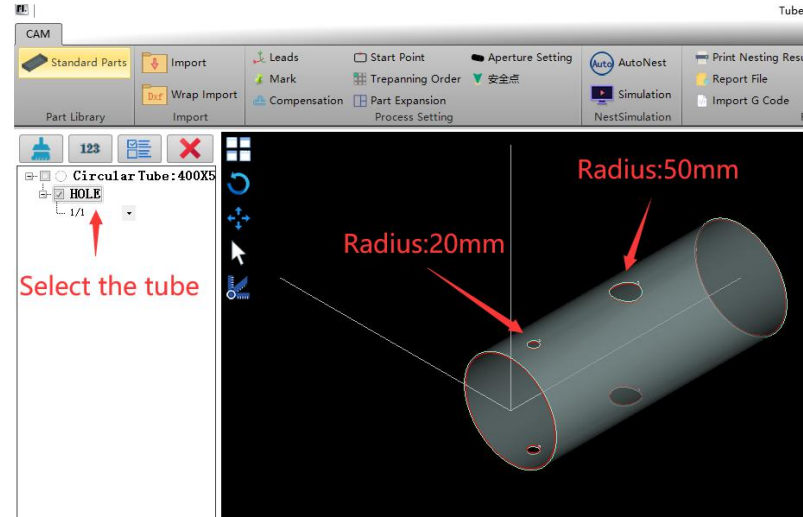
```

Aperture code

Round hole code

Setting steps:

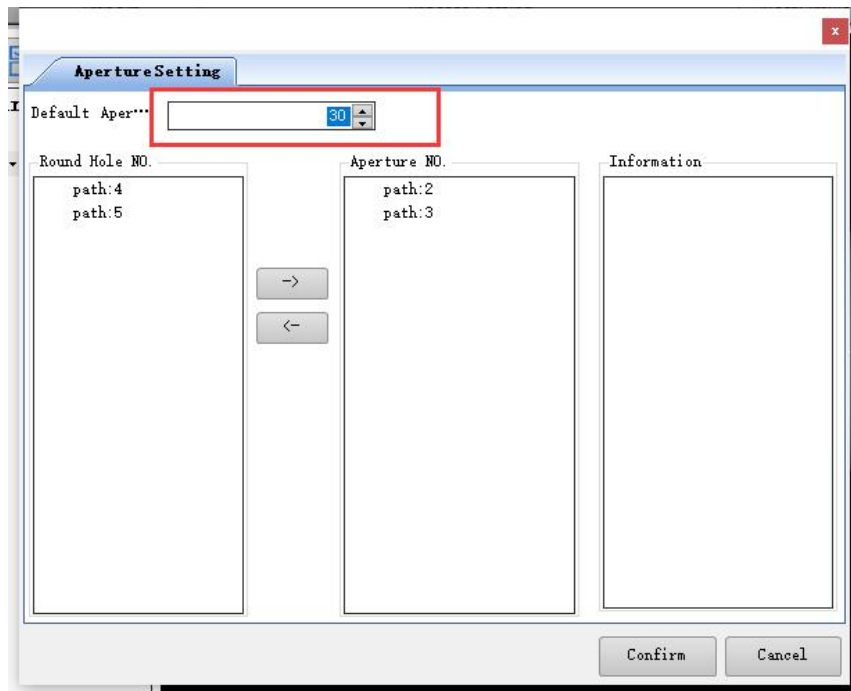
There are a circular tube with two holes (20mm and 50mm).



Step 1: Select the tube.

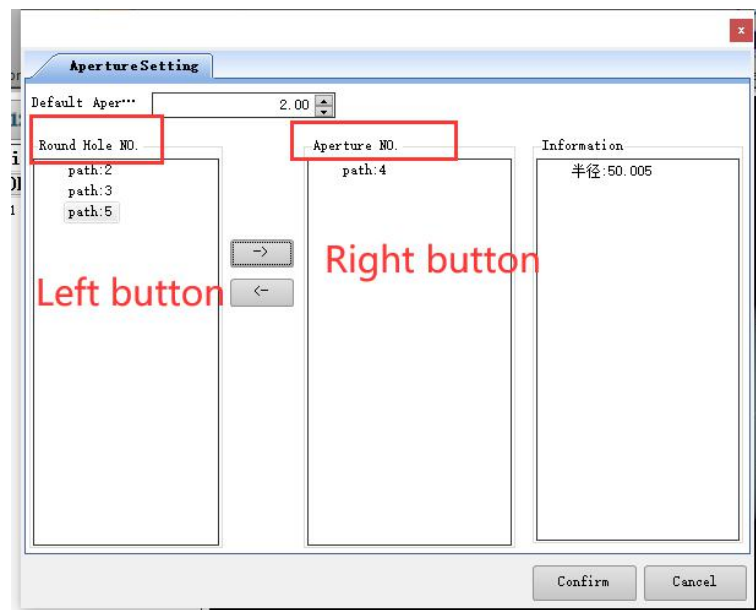
Step 2: Batch set aperture:

Only need to input the default aperture radius and press enter key. The holes (radius ≤ 30 mm) will be set as aperture.



Step 3: Set aperture manually

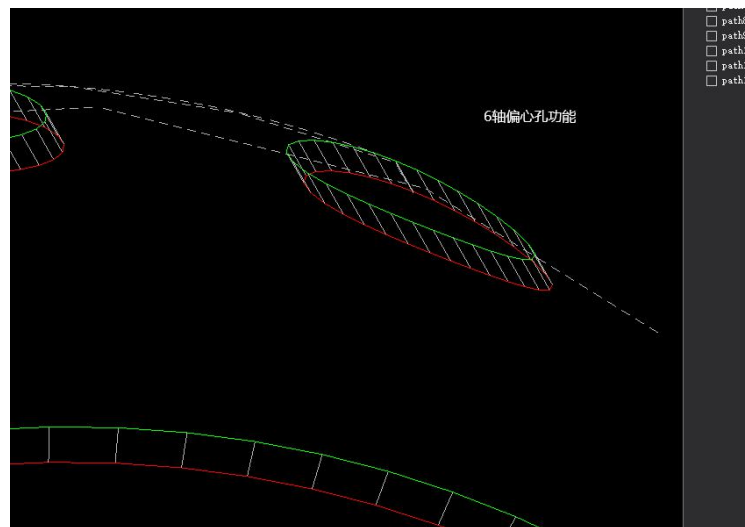
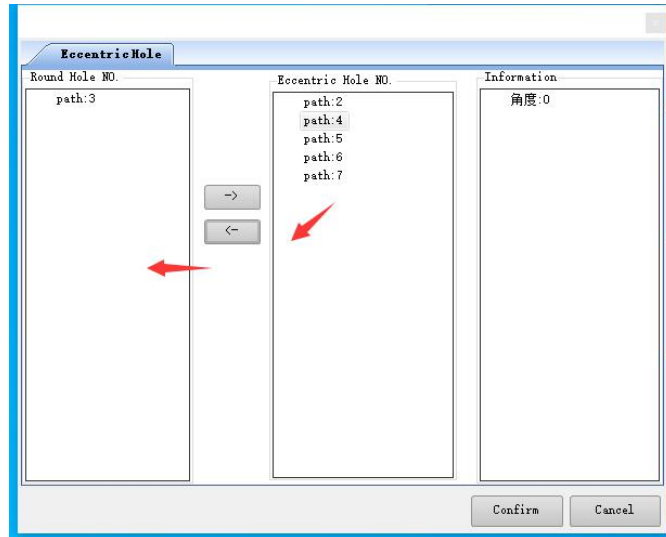
Users only need to select the path and press the right button. On the contrary, press the left button.



3.6 Eccentric hole

Eccentric hole need lift shaft and horizontal shaft to operate and only suitable for round pipe.

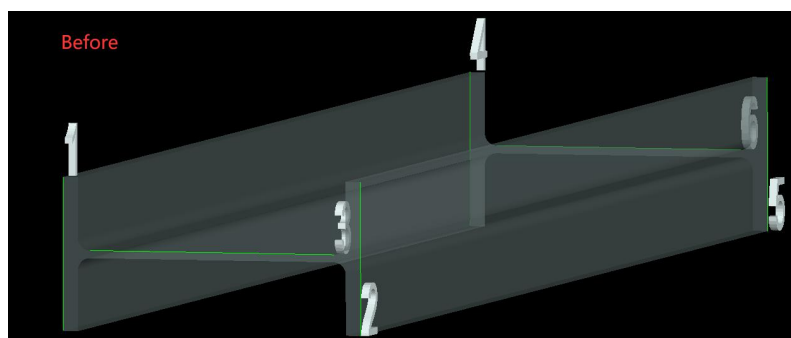
Step1:

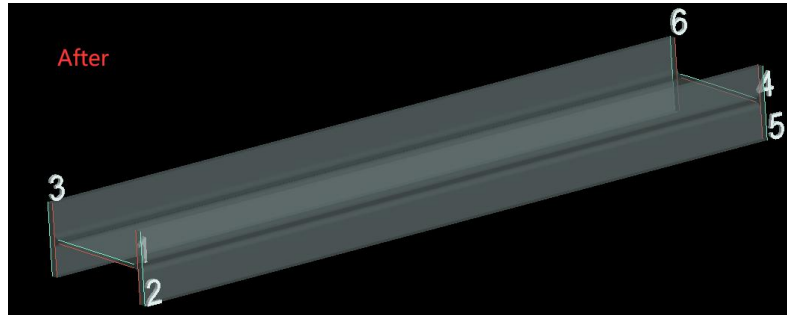


3.10 Optimize

3.10.1 Cut Web First(H shape)

The cutting sequence will cut the web first and then cut the two flanges.
Users can also choose the function of *Cut flange first(H Shape)* as needed.





3.10.2 Trepanning order

If there are dense holes on the tube, you can sort the holes to prevent the chuck from rotating.

The user can sort holes to the selected parts or to all parts

Sort by X axis distance: The order of the holes will be sorted according to the distance between the hole and X axis. The closer, the smaller cutting order.

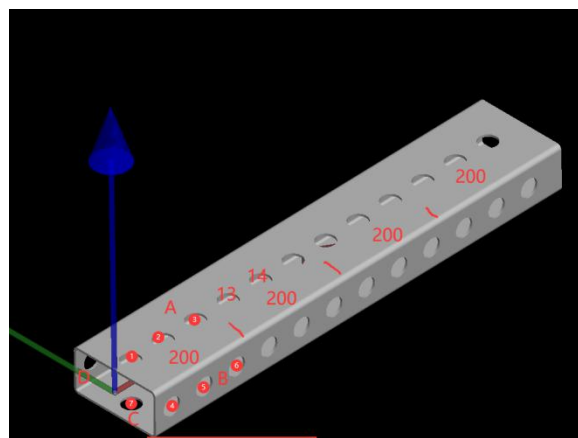
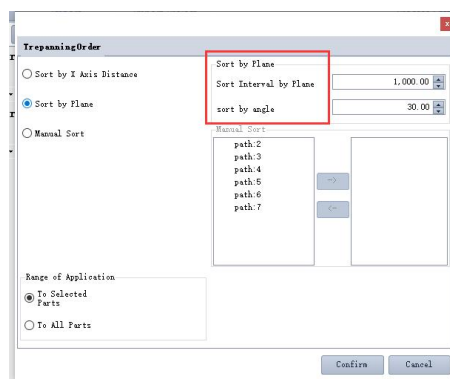
Sort by plane: Cutting the tube according to the plane. Users need to set the interval of the surface. After one surface are finished, another surface will be cut until all the holes are finished.

For example:

There is a Rectangle tubewhich has four surface(A/B/C/D)

The sort interval is 200.

Sort by angle: The holes will be sorted by angle in the certain distance.



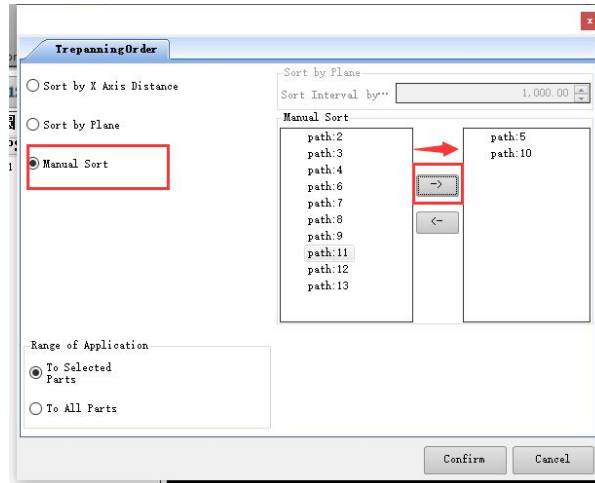
Manual sort:

It is necessary to specify the order of openings according to some cutting requirements.

For example:

The Path 5 and 10 are moved to the right. The new cutting order will be :

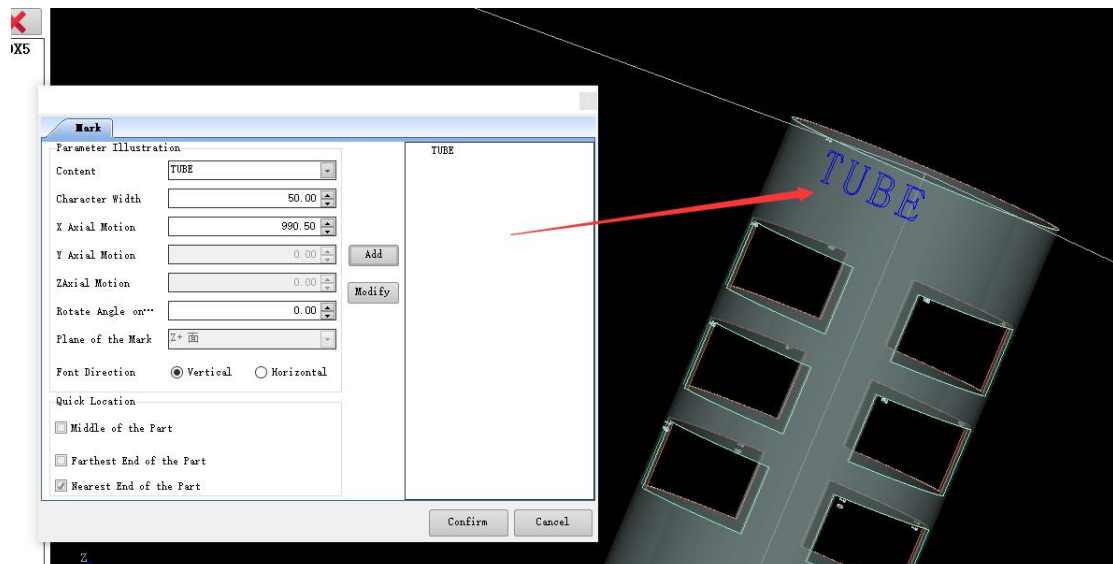
Path 1(Previous Path 5)- Path 2(Previous Path 10)-Path 3(Previous Path 1)-Path 4(Previous Path 2)-



3.10.3 Mark

Users can mark the parts according to their own needs. Marks only leave marks on the part and do not penetrate them.

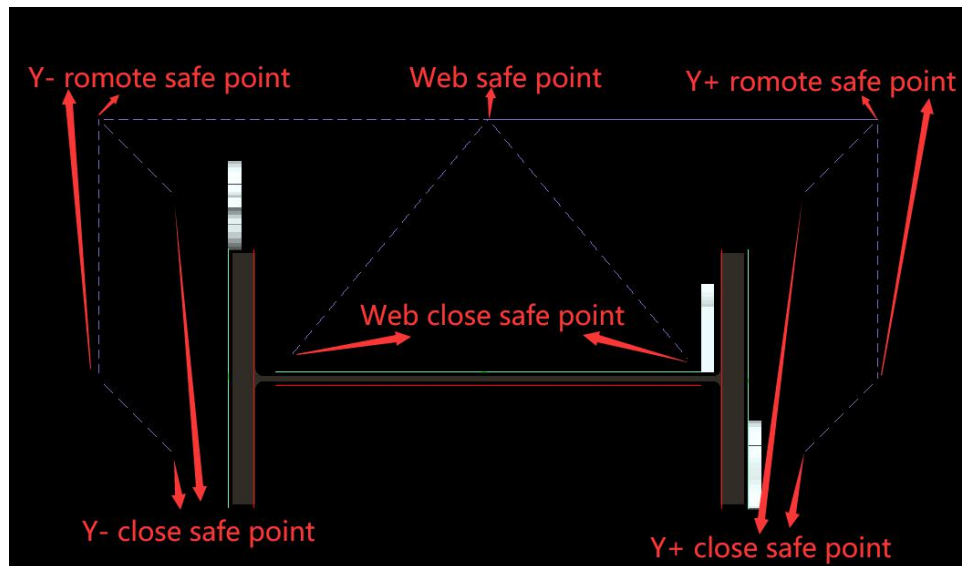
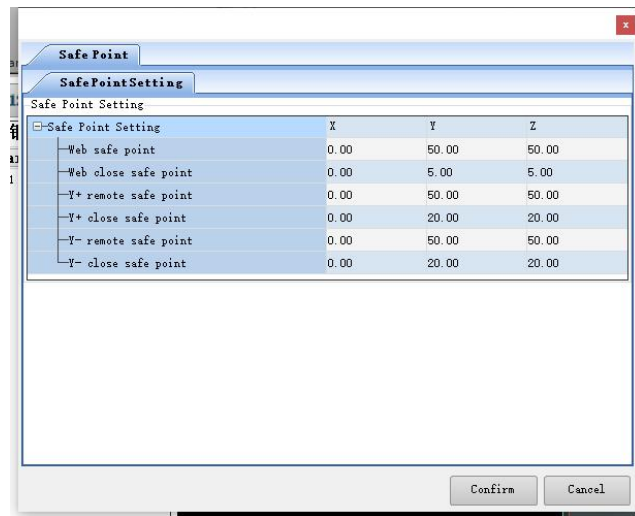
Users can set the character width, location, direction parameters.



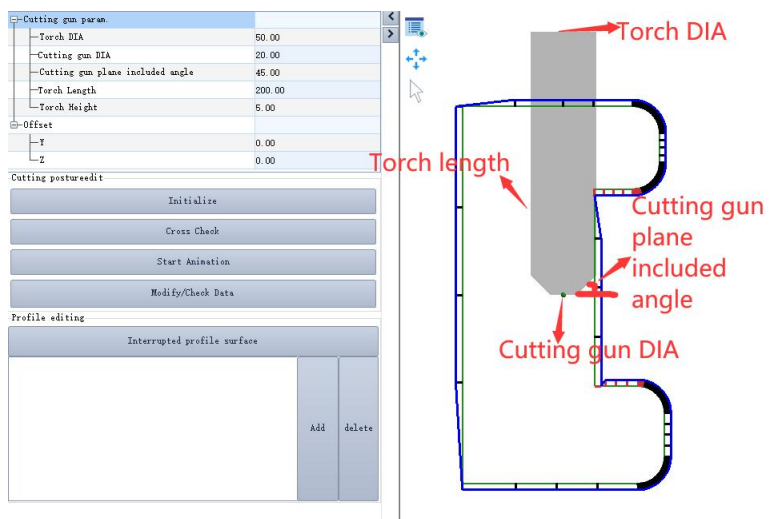
3.10.4 Safe point

The parameters can be set as needed. Safe point and angle can ensure the

mechanical arm do not touch the part.



3.10.5 Edit contour vector



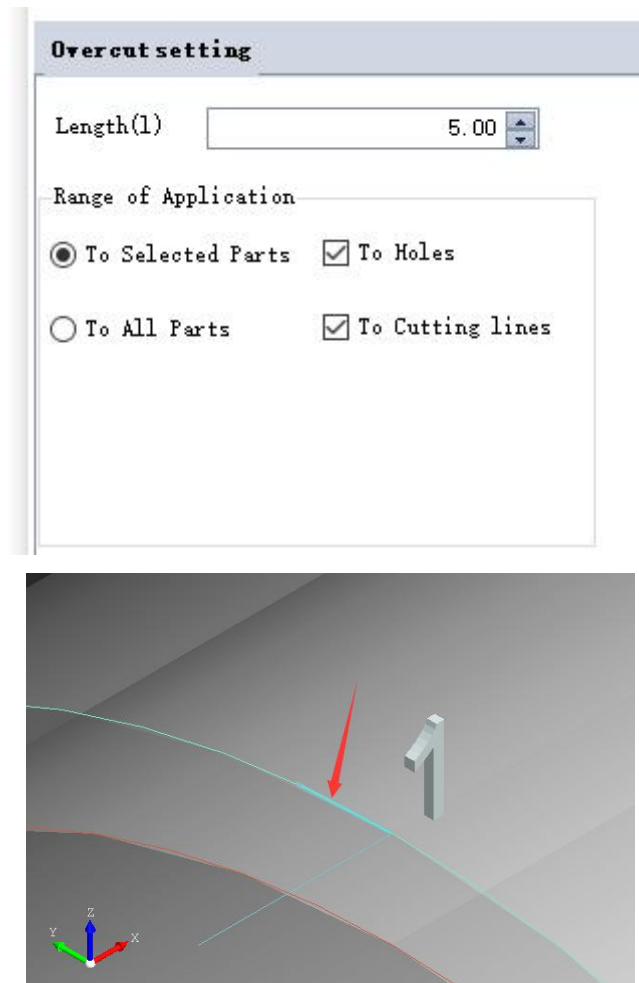
Cutting gun plane included angle: The bigger the angle is , the sharper the torch gun is .

Torch height: The blue line is the path line of the cutting gun. The green line is the contour line of the part. The height between the green and blue lines.

Offset: There may be a deviation in the center of the part in actual cutting. Users can set the offset parameters according to actual cutting.

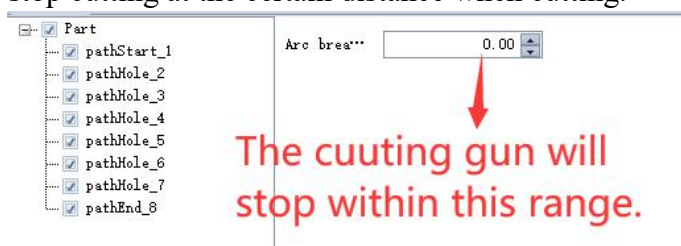
3.10.6 Over cut

Users can set the following parameters to over cut the part when it can not be cut off.



3.10.7 Interruption in advance

Users can select the cutting line to set *interruption in advance*, which means the cutting gun will stop cutting at the certain distance when cutting.

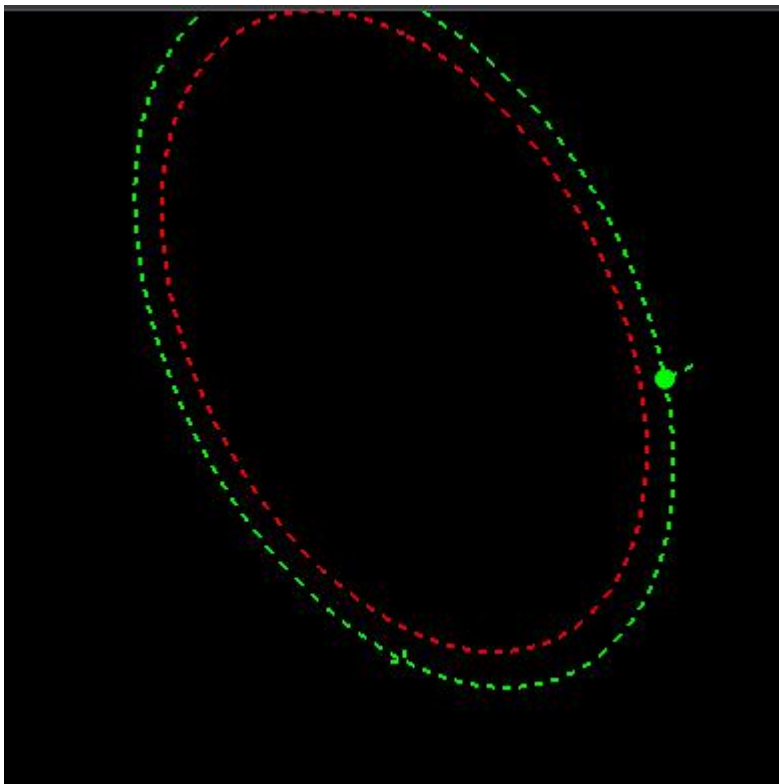


3.11 Path setting



3.11.1 Start point

Note: Selecting the starting point can only be effective for closed curve, but not for micro unclosed curve.

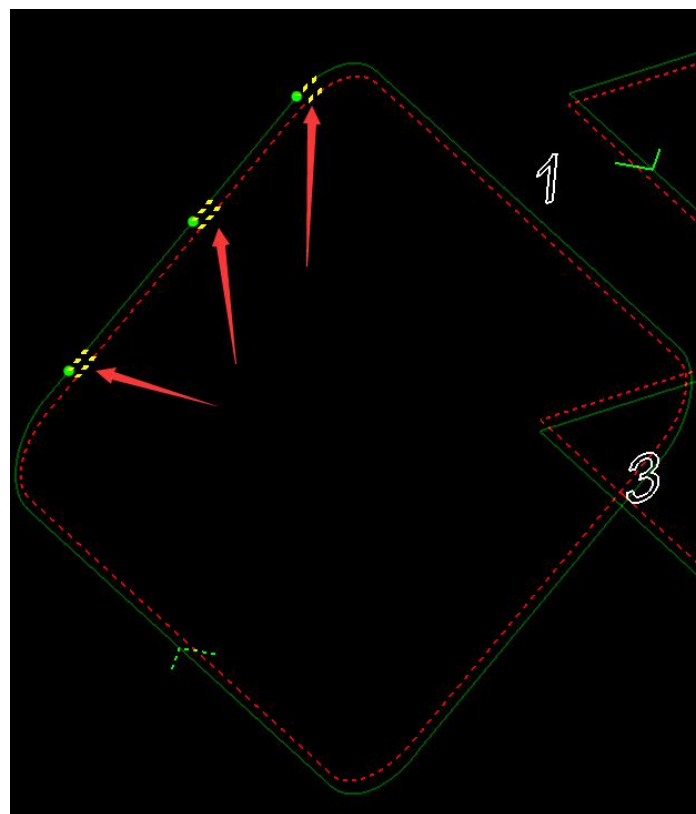
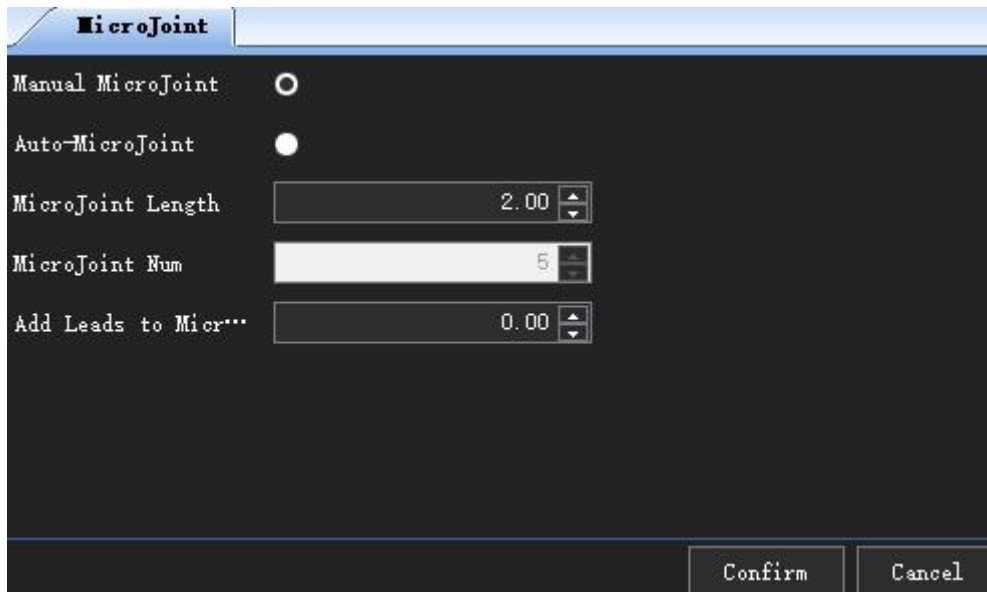


3.11.2 MicroJoint

Micro joint based on quantity and distance.

Manual MicroJoint: directly click micro joint button to conduct manual micro connection. Click the point that need to add micro joint, and micro joint section will be added where mouse clicks;

Auto MicroJoint select the path and click automatic micro joint button, micro joint will be conducted.



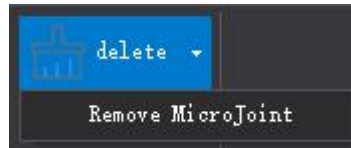
3.11.3 Path fitting

When the cut points of the multi-segment line are few, the multi-segment line can be simulated into a smooth curve.

It is limited to the open path, and it is a completely smooth path, such as round /oval/obround hole, and square holes or holes that should have multiple segment lines cannot use this function.

3.11.4 Delete

Users can remove MicroJoint as needed.



4. Nest simulation

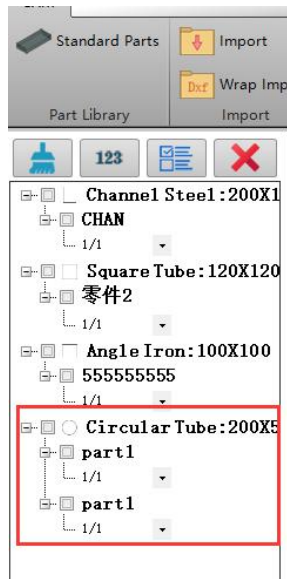
4.1 Auto nest

Step 1: Import

A: Users can create the tube and export to the nest interface.

B: Import "STP "or "SJ "files.

The software supports to import different tube types. Parts of same section will be merged.



Step 2: Set quantity

Users can input the quantity under the part. (Unnested quantity/ All quantity)

Note: Modifying the number of parts is incremental.

For example:


The original number is (4/6)(There are 6 parts need to nest, and 4 parts unnested)


We modify the number to 10,(add 10 more parts to the original quantity), so the all quantity is 16 now.



: Remove all parts at one time.

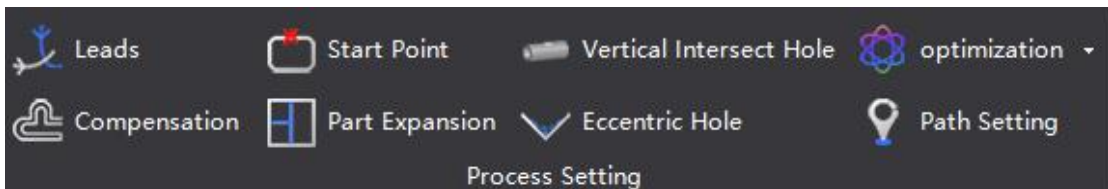
123: The quantity can be batch set.

: Select or cancel all parts.

: Delete the selected parts.

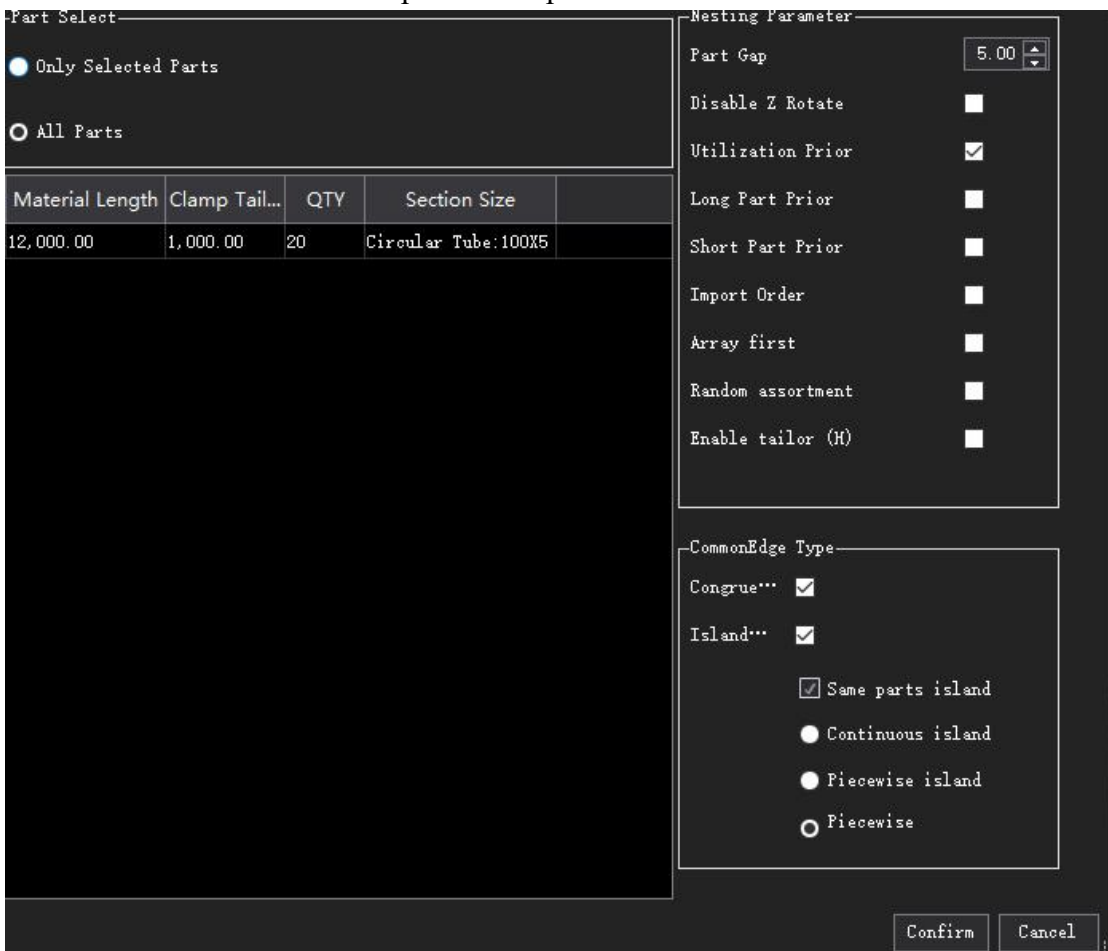
Step 3: Set process

Users can set the process as needed.



Step 4: Autonest

Users can choose the selected parts or all parts to nest.



- Material length: The length of the raw material.
- Clamp tail length: The clamped length of the tail end of the raw material which is used as a scrap area to prevent the torch and clamp colliding during cutting. This length is not used for nesting.
- QTY: The quantity of raw material.
- Section size: The size information of the raw material.

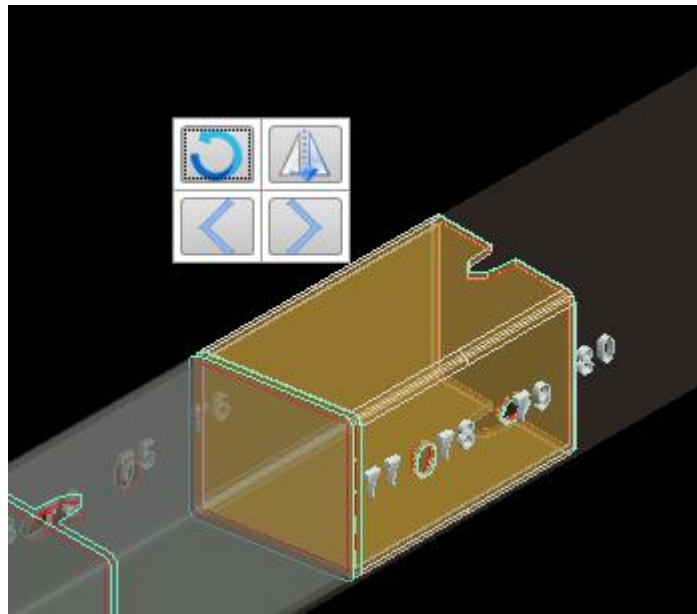
- Part gap: The gap between parts in the case of non-common edge.
- Disable Z Rotate: The parts will not rotate on Z axis.
- Utilization Prior: Nest the parts in the way of highest utilization.
- Long Part Prior: The longer parts will nest first.
- Short Part Prior: The shorter parts will nest first.

Step 5: Nesting result

The nesting result will be displayed at the bottom of the software. Different types of tubes can be nested at the same time.

part1		part1		part1		part1		part1	
Dele...	Parts	QTY	Material Le...	Remanent ...	Clamp Tail Len...	Nested QTY	Thumbnail	Lock	Add
	Circular Tube:273X6	1	12000	6995.464	1000	5		<input type="checkbox"/>	
	Rectangle Tube:100X100X8	1	12000	9494.887	1000	5		<input type="checkbox"/>	
	H Shape:200X100X10	1	12000	9471.793	1000	5		<input type="checkbox"/>	

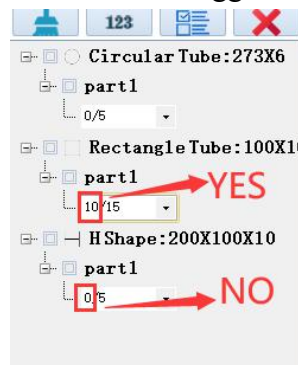
Users can choose the parts to rotate, flip, move up or down as needed.




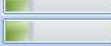

Users can delete the nesting result to renest as well as add parts after nesting.

Add parts after nesting:

Step 1: Make sure the unnested number is bigger than zero.

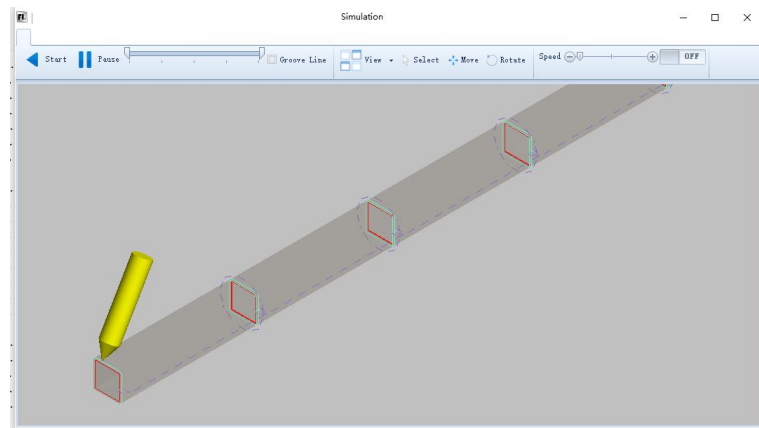


Step 2: Click “+”

Dele...	Parts	QTY	Material Le...	Remanent ...	Clamp Tail Len...	Nested QTY	Thumbnail	Lock	Add
-x	Circular Tube:273X6	1	12000	6995.464	1000	5		<input type="checkbox"/>	+ 13:58:07
-x	Rectangle Tube:100X100X8	1	12000	9494.887	1000	5		<input type="checkbox"/>	+ 14:02:21
-x	H Shape:200X100X10	1	12000	9471.793	1000	5		<input type="checkbox"/>	+ 14:02:21

4.2 Simulation

Users can simulate the cutting.



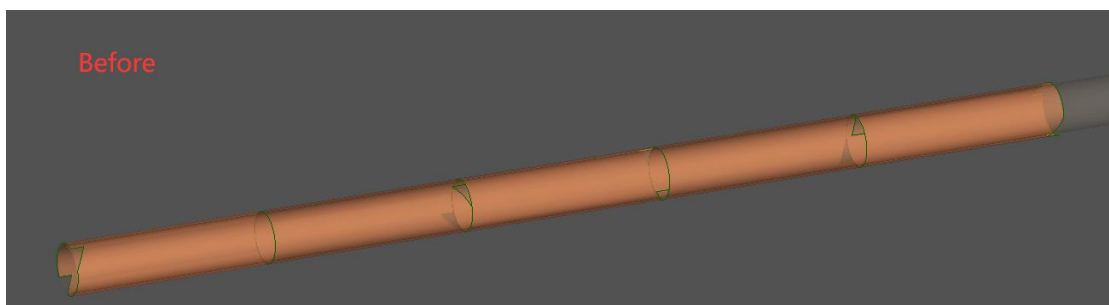
The yellow gun: the gesture of the cutting gun.

Arrow: the direction of the cutting.

Dotted line: the move path of the cutting gun.

4.3 Island

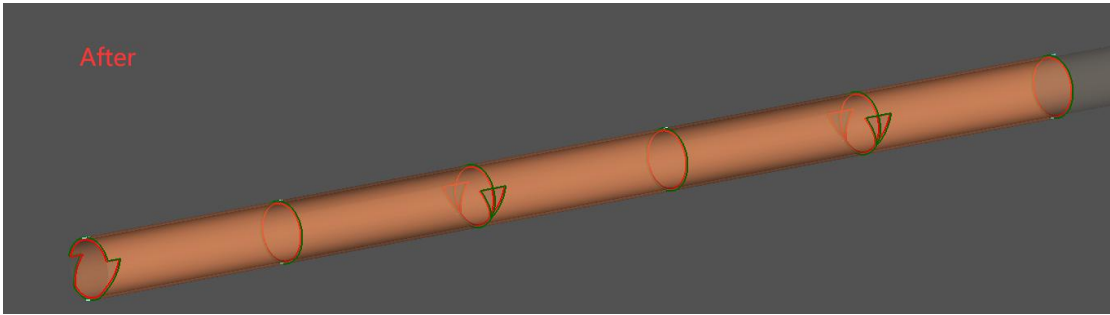
Parts with holes in end heads which can be combined into a whole cutting. As shown in the figure below, the end of the round tube has a small triangle, and the end of the two tubes can merge the small triangle into a large triangle cutting.



Continuous island:Cut the end once.

Advantage:The whole end is cut once to avoid multiple cutting. The trace distance is minimized.

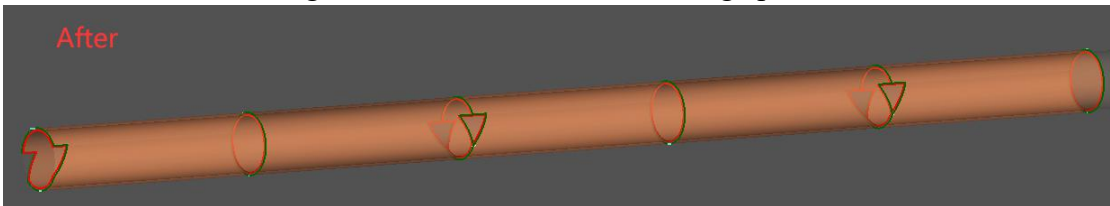
Disadvantage:Does not apply to island irregularities. Only suitable for island axisymmetric graphics.



Piecewise island: First cut the island part and then cut the end.

Advantage: There are fewer trace.

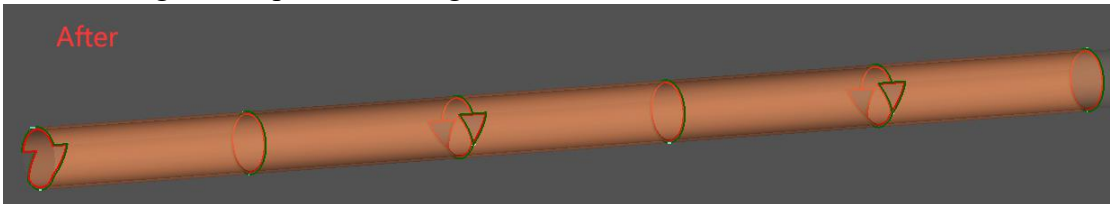
Disadvantage: Since most of the end is cut, the tube may be thrown, and the tube will fall before all the cutting is finished. Not suitable for large parts.



Piecewise island(Cutting first): Cut the end of the first part firstly, and then cut the second uncut island part.

Advantage: Avoid the tube fall off.

Disadvantage: Multiple arc starting.

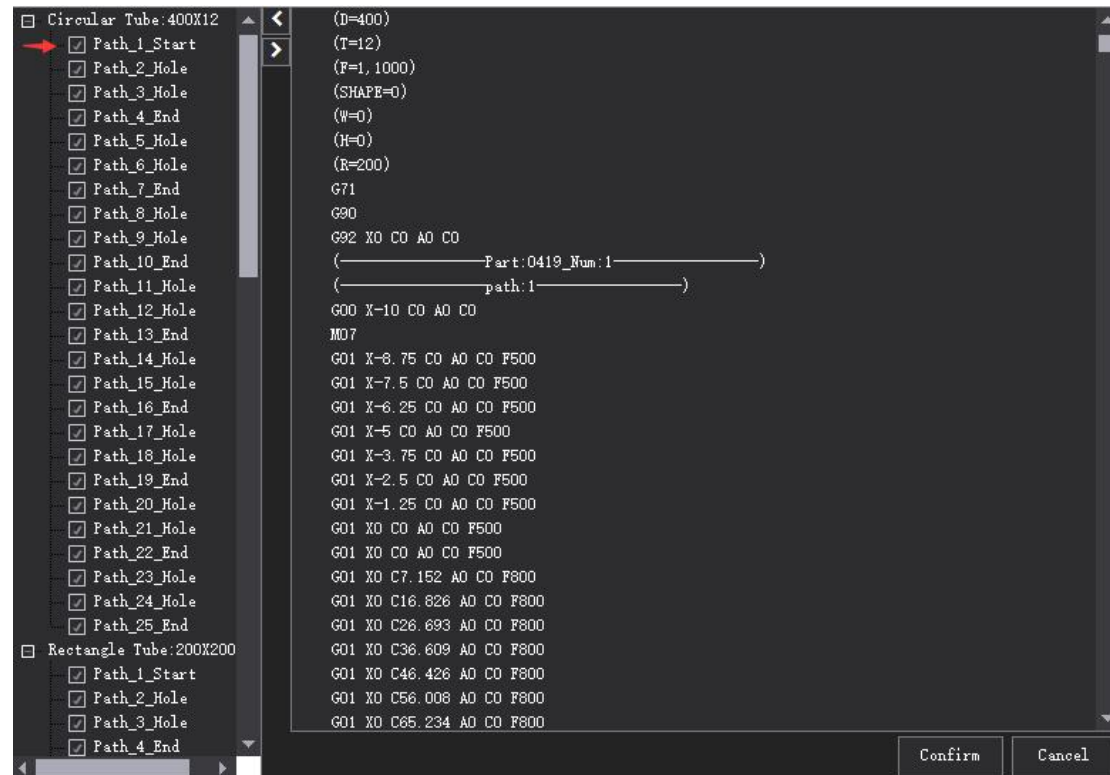


5. File

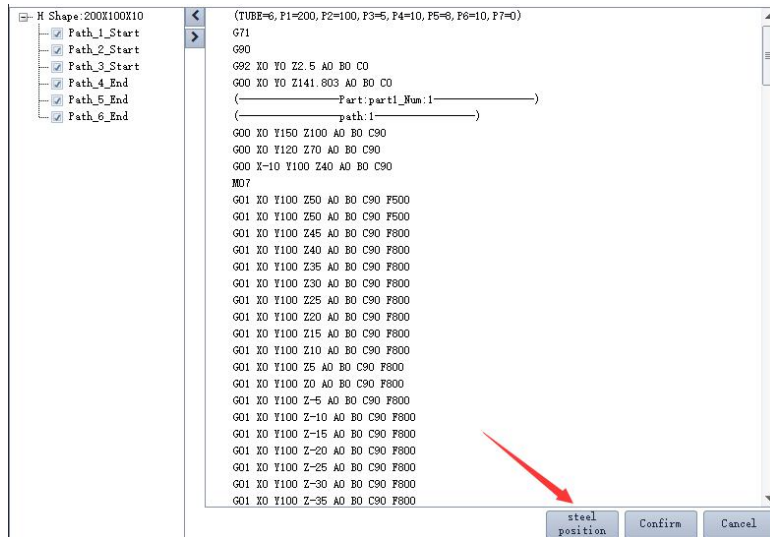
5.1 Code

The cutting code can be generated after nesting. Please make sure the Axis configuration is correct. If the code is correct, it can be used for actual cutting.

Users can select the required cutting path to generate code according to their needs. As shown below, you don't want to cut path 1 (start), just leave path 1 unchecked.



If there is an deviation in the actual cutting, the software supports to sett the profile position offset when the H steel/channel steel generates the cutting code.Please set the following offset values according to the site conditions. (Only chuck code)



5.2 Proofing code

Only one part will be generate cutting code for proofing to check the cutting code is correct or not.

The software supports to batch generate the proofing code.



5.3 Print nesting result

The nesting result can be printed.

Name	Nested QTY	Material Length	Nested Length	Remanent Length	Utilization
Circular Tube:273X6	5	12000	5004.536	6995.464	42%
Rectangle Tube:100X100X8	5	12000	2505.113	9494.887	21%
H Shape:200X100X10	5	12000	2528.207	9471.793	21%
Circular Tube:273X6	Part Length				
part1	1000				
part1	1000				
part1	1000				
part1	1000				
part1	1000				
Rectangle Tube:100X100X8	Part Length				
part1	500				
part1	500				
part1	500				
part1	500				
part1	500				
H Shape:200X100X10	Part Length				
part1	500				
part1	500				
part1	500				
part1	500				
part1	500				

Craft	
Verify	
Production Group	
Operator	
Date	2021-01-17

5.4 Print



Part Name:	part1	part1	part1	part1
	part1			
Nested QTY	Material Length	Remanent Length	Utilization	
5	12000	9494.887	21%	
Type	Width(w)	Height(h)		
Rectangle Tube 100	100	100		

5.5 Report File

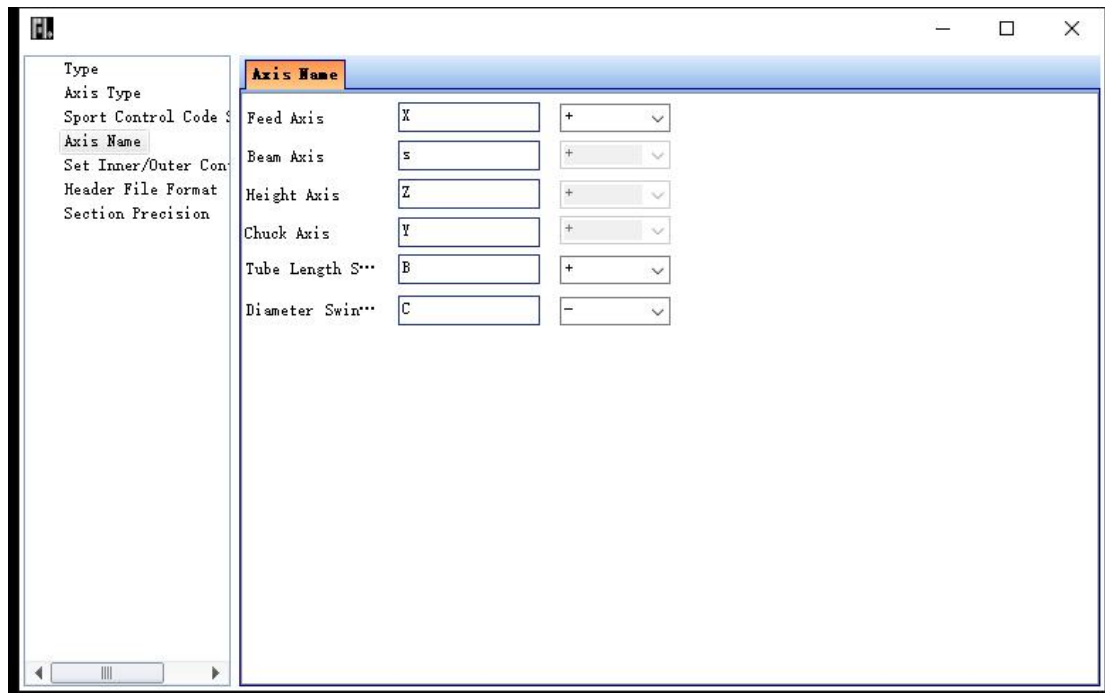
The report file is Excel, so users can check the nesting result more quickly.

	A	B	C	D	E
1	Part Name	Material Length	Remanent Length	Nested QTY	Utilization
2	Circular Tube:273X6	12000	6995.464	5	42%
3	Rectangle Tube:100X100X8	12000	9494.887	5	21%
4	H Shape:200X100X10	12000	9471.793	5	21%
5					
6	Size	Part Name	Part Length	Nested QTY	Total QTY
7	Circular Tube:273X6	part1	1000	5	5
8					
9	Size	Part Name	Part Length	Nested QTY	Total QTY
10	Rectangle Tube:100X100X8	part1	500	5	15
11					
12	Size	Part Name	Part Length	Nested QTY	Total QTY
13	H Shape:200X100X10	part1	500	5	5
14					

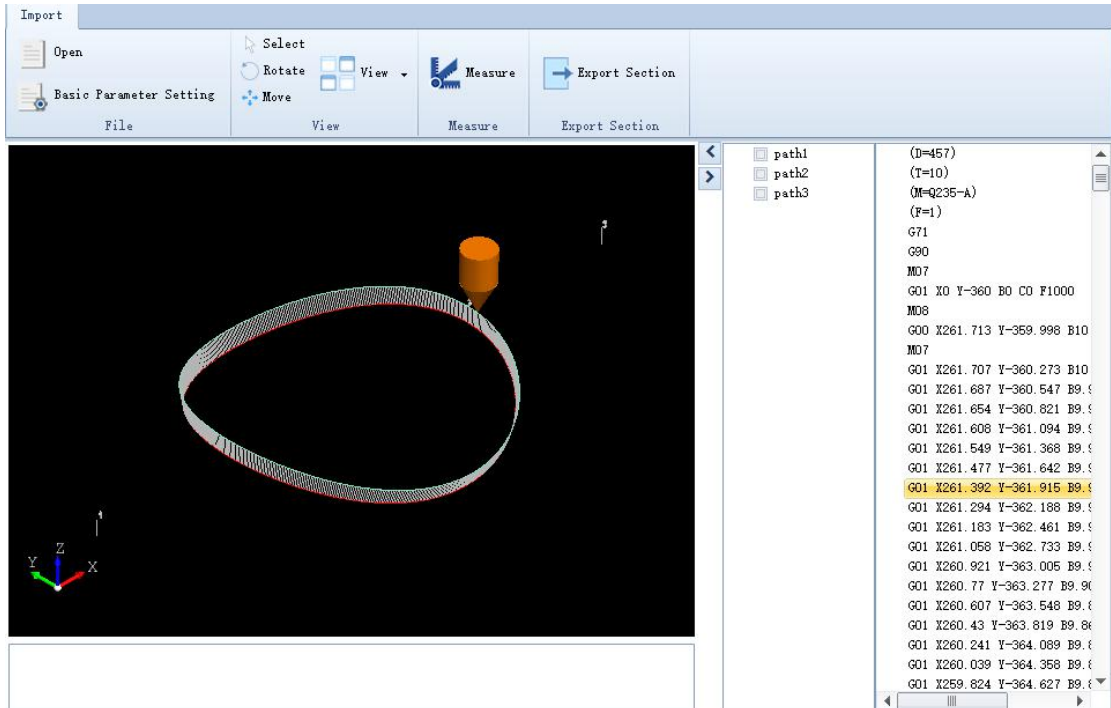
5.6 Import G code

The software supports to import G code to check tube information.

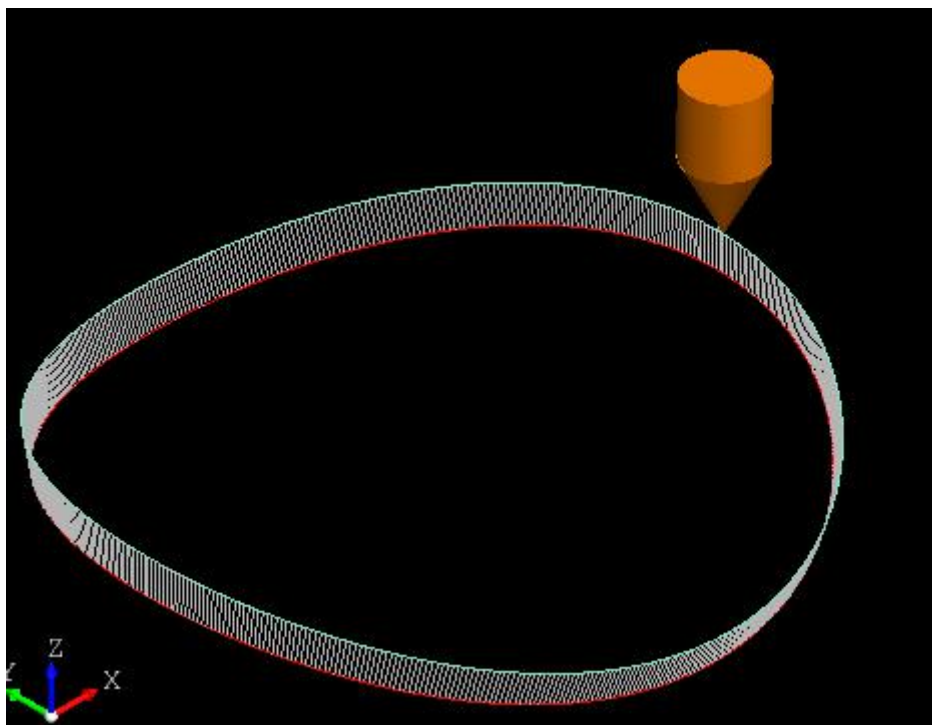
Step 1 : Set basic parameters. Such as axis type and axis name and direction.



Step 2: Open the G code.

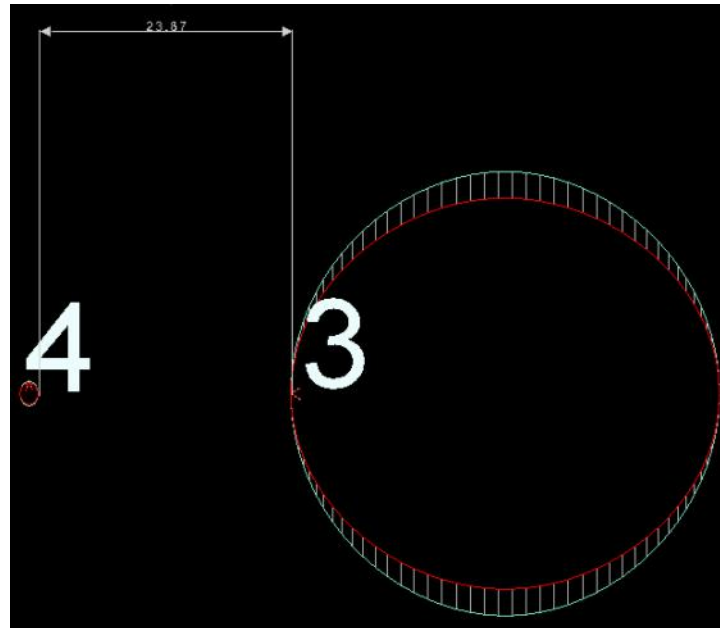


Step 3: Users can check the tube information. The code can be modified. Click on a line of code, and the simulated cutting gun will be displayed on the corresponding path.



The distance between two paths will be displayed at the bottom of the software by selecting two paths.

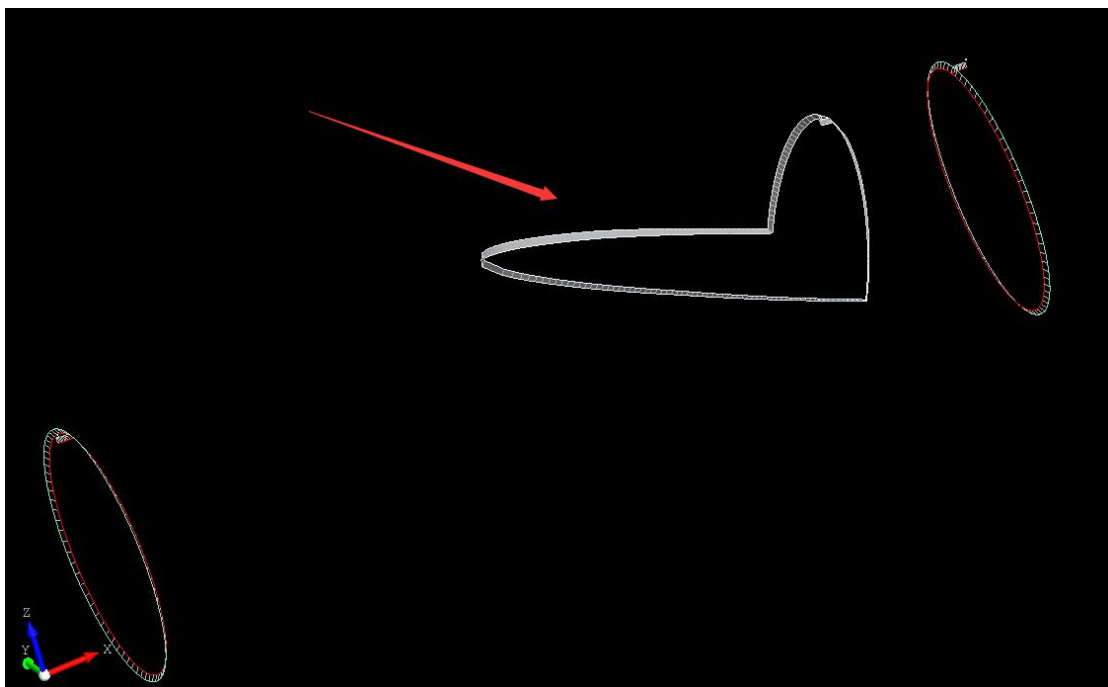
If you want to measure the distance between two points, please select the view first, and then click the two points you want to measure. The display area displays the results.



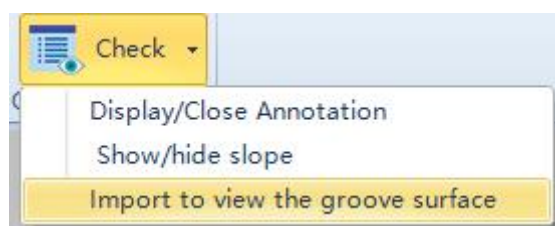
Export section

The selected section information can be exported to the specified location in the format of.iges. This function is used to verify that the groove is correct or not.

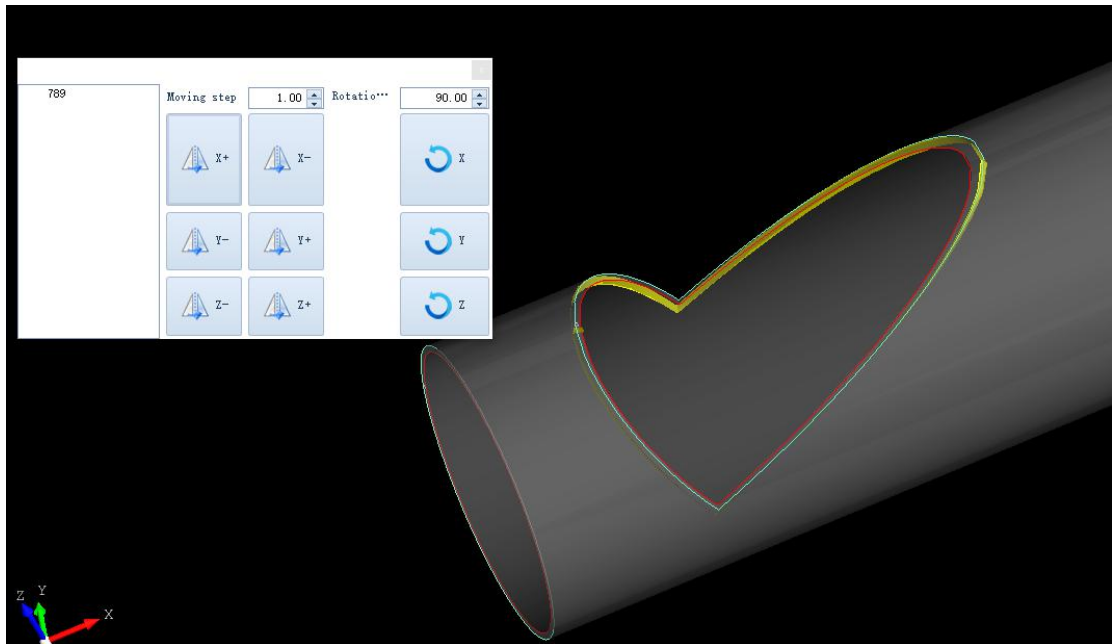
Step 1: Choose the section and export the section.



Step 2: Import to check the groove surface.



Step 3: Set the movement value and move the groove surface. If the two can coincide, the groove surface is correct. Otherwise, it is necessary to check again whether the generated groove is correct.














6. Setting

6.1 Basic parameter setting





6.1.1 Color

Users can set the color according to personal preference

Background Color	
Part Background Color	
Simulation Background Color	
Part Expansion Background Color	
Track Line Color	
Outer Contour Color	
Inner Contour Color	
Idle Color	
Import Part Color	
Import Part Color	
Interface Style	
Interface Style	Office2010Blue 
TabControl Style	Office2003 
Font Color	
Background Color	

6.1.2 Size

Users can set the height and thickness of the font according to personal preferences. Users can also set the speed of the simulation.

NO.	
show path label	<input checked="" type="checkbox"/>
Font Height	5.00 
Font Thick	0.50 
Direction Arrow	
Direction Arrow	2.00 
Simulation	
Speed	1.00 
Draw Path	
Import contour lines	<input type="checkbox"/>
Import cutting lines	<input checked="" type="checkbox"/>

Import contour lines: the software will import the part with its original lines.

Import cutting lines:the software will import the part with the processing lines, such as leads/compensation/bevel

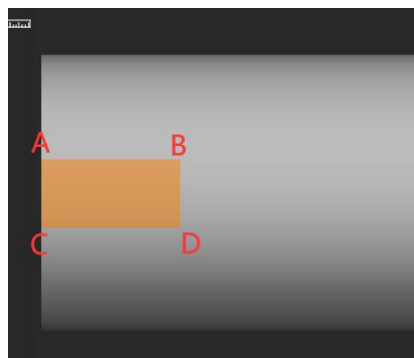
6.1.3 Model precision

Model Precision	
Discrete accuracy	
Line Segment Length	5.00
Curve Segment Length	5.00
Discrete MAX Points	60.00
Discrete MIN Points	35.00
bool Discrete Precision	
Cir Tube Import Speed-up	<input checked="" type="checkbox"/>
Line Segment Length	2.00
Cir tube Discrete Angle	5.00
Ends Discrete Angle	5.00
Rectangle Tube Precision	
Rectangle Tube Corner Segment Length	2.00
Rectangle Tube Fillet Precision	1.00
Square tube corner dispersion angle	5.00
Round tube accuracy	
CirTube outer contour point accuracy	0.50
CirTube inner contour point accuracy	0.50
Judgement accuracy of inner and outer wall thickness of round pipe	0.50
Combine Hear	
Distance	0.50
Outer/Inner Contour Methods	
Outer/Inner Contour Methods	Perpendicular
Notch accuracy	
Notch accuracy	0.50
Minimum length of notch	20.00

- Password:123456.
- Line Segment Length:The smaller the length, the finer the line.A line can be divided into points according to a certain length. For example: a 5mm line, which can be divided into 5 segments of 1mm with a total of 6 points according to 1mm. It will take effect when the model is re-imported after setting.
- Curve Segment Length:The smaller the length, the finer the curve..A curve can be divided into points according to a certain length. For example: a 5mmcurve, which can be divided into 5 segments of 1mm with a total of 6 points according

to 1mm. It will take effect when the model is re-imported after setting.

- Discrete MAX Points: The maximum number of points, if the arc is not smooth enough, the number of points here can be larger. The number of discrete points of a line or curve cannot exceed this value; otherwise, it will discrete again according to the maximum number. It will take effect when the model is re-imported after setting.
- Discrete MIN Points: The number of discrete points of a line or curve should exceed this value. It will take effect when the model is re-imported after setting.
- Rectangle Tube Corner Segment Length: The smaller the length, the finer the corner. It will take effect when the model is re-imported after setting.
- Rectangle Tube Fillet Precision: It is used to judge whether the point is on the rectangle tube. The smaller the value, the higher the accuracy of the model. It will take effect when the model is re-imported after setting.
- Combine Near: Combine two line segments into one. It will take effect when the model is re-imported after setting.
- CirTube outer contour point accuracy: It is used to judge whether the point is on the outer contour; The smaller the value, the higher the precision. It will take effect when the model is re-imported after setting.
- CirTube inner contour point accuracy: It is used to judge whether the point is on the inner contour; The smaller the value, the higher the precision. It will take effect when the model is re-imported after setting.
- Outer/Inner Contour Methods : Users can choose the method as needed. (Ray/Perpendicular/Angular Bisector)
- Slot accuracy: Under normal circumstances, $AB \parallel CD$ is consistent with the direction of the pipe length, but there may be some error between AB or CD and the direction of the pipe length in the drawing. At this time, the accuracy of the slot can be set. When the error is less than the precision value, the slot with error will be a straight slot.



- Minimum length of slot: When the AC or BD value is less than the minimum length of the slot, the software will ignore the slot.

6.1.4 Nesting accuracy

Nesting accuracy	
Nesting accuracy	
CommonEdge Precision	1.00
Nesting Rotate Angle	5.00
Part rotate angle	90.00
Merge the Same	
Merge the Same	0.01
Fast nesting	
Fast nesting	<input type="checkbox"/>
Random nest cycle index	1000
Random nest tolerance	100.00
Draw Nesting Path	
Copy path	<input checked="" type="checkbox"/>
Redraw path	<input type="checkbox"/>

- CommonEdge Precision: The larger the value, the easier to share common edge.
- Nesting Rotate Angle: The smaller the value, the finer the nesting result.
- Merge the Same: This function can be selected when the tube diameter cannot be combined into the same profile due to the error.
- Manual Rotate Angle: The parts can be rotate according to this angle manually after nesting.
- Fast Nesting: When there are many kinds of parts need to be nested, this function can accelerate the nesting speed.
- Random nest cycle index: This parameter is to set the number of random nesting and choose the best result among the nesting results.
- Random nest tolerance: Considering that the concave and convex parts can be combined with each other, this parameter value is added to the length of the raw material to make the nesting result better.

6.1.5 Tube type

Tube Type	
Rectangle Tube	
Mechanical MIN Radius	1.00
Smooth transition of square tube corners	<input checked="" type="checkbox"/>
C shape	
Single Cut	<input type="checkbox"/>
Treble Cut	<input checked="" type="checkbox"/>
Mechanical MIN Radius	10.00
Channel steel three-knife cutting web interrupted	<input type="checkbox"/>
L Shape	
Single Cut	<input type="checkbox"/>
Double Cut	<input checked="" type="checkbox"/>
Mechanical MIN Radius	9.00
Exchange P1P2 values	<input checked="" type="checkbox"/>
H Shape	
Starting Angle of Corner	45.00
Gun Reach Angle	45.00
Gun Reach Protec Distance	20.00
Make path point dense(H shape)	<input checked="" type="checkbox"/>
MIN hole radius(H)	20.00
Web aligned in X direction(H)	<input checked="" type="checkbox"/>
Part Type	
Part Type	Any Parts
NC1文件	
Default QTY (NC1)	<input type="checkbox"/>
Scollop Margin	0.00

- Rectangle Tube

Mechanical MIN radius: This parameter will be set according to the cutting machine.

Smooth transition of square tube corners: It will smooth the track of the corner of rectangular tube.

- C shape

Single Cut: Cut the end by single cut.

Treble Cut: Cut the end by three times.

Channel steel three-knife cutting web interrupted: Channel steel will be cut by three times and the break is located on the web.

- L Shape

Single Cut: Cut the end by single cut.

Double Cut: Cut the end by two times.

Exchange P1P2 values: The value of two flanges will be exchanged.

- H Shape

Starting Angle of Corner: It is used for cutting corners, the default is 0, the maximum is 90 degrees.

Gun Reach Angle: Rotate the cutting gun into the web to avoid the collision between the cutting gun and the flange.

Gun Reach Protect Distance: After the torch is inserted into the web, it will slowly turn to the vertical, which must be greater than the cutting gun radius, the default is 50mm.

Make path point dense(H shape): It will make the cutting line more dense which will cut the tube better.

MIN hole radius(H): The hole will be ignored if the radius is less than this value.

Web aligned in X direction(H): The tube web will be aligned in X direction after importation.

Part type: The default part type when importing.

6.1.6 Constrain angle

MAX Angle of Machine : Set the maximum angle of the groove to prevent the machine from hitting the torch according to the situation of the equipment.

Users can also choose the plasma dextrorotation as well as default groove as needed.

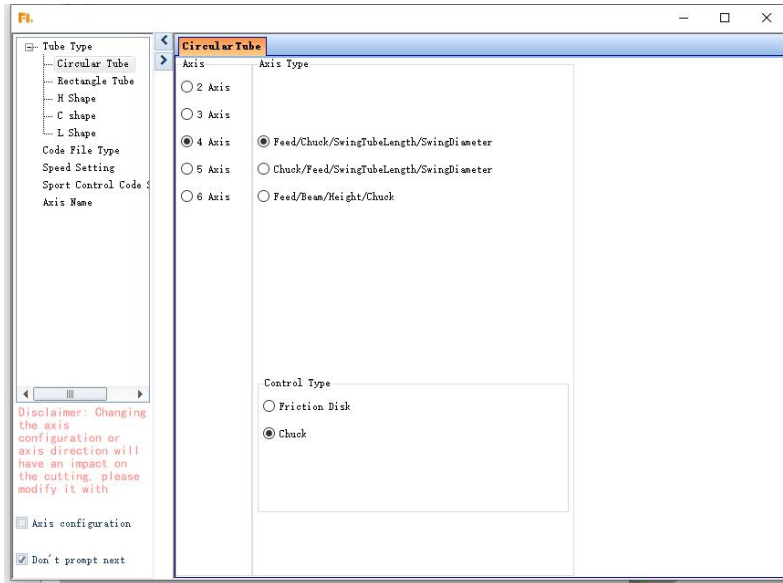
ConstrainAngle	
MAX Angle of Machine	
MAX Angle of Machine	45.00
Cutting direction	
Plasma dextrorotation	<input checked="" type="checkbox"/>
Default Groove	
Constant Groove	<input checked="" type="radio"/>
Dynamic Groove	<input type="radio"/>
Groove Angle	30.00
Cutting More	<input checked="" type="checkbox"/>

6.2 Code file setting

Note: changing the axis configuration or axis direction will have an impact on the cutting. Please modify it carefully.

Users need to check "Axis configuration" before setting.

You don't have to set it next time if you choose the "Don't prompt next".

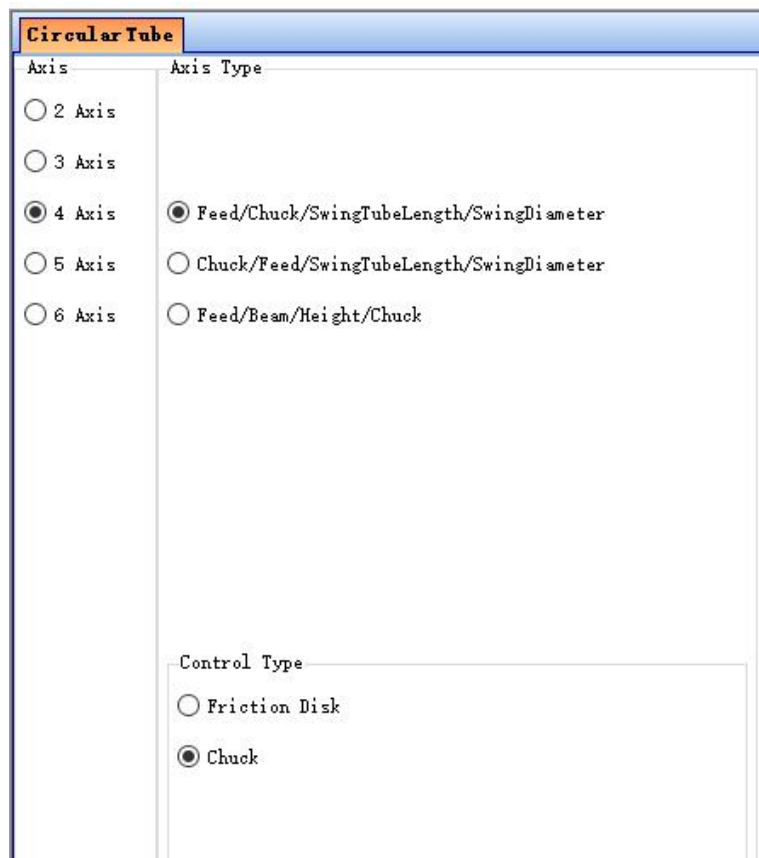


Circular Tube:

The axis configuration of the circular pipe is shown in the following figure. Users select the corresponding axis configuration and control type according to their own equipment.

Friction Disk: The length of the radian of rotation is the rotate axis data, that is, the end code is the section circumference of the circular pipe.

Chuck: Rotate angle of chuck is the rotate axis data, that is, the end code is to go 360° .



Rectangle Tube:

Rectangle Tube	
Axis	Axis Type
<input type="radio"/> 4 Axis	
<input checked="" type="radio"/> 5 Axis	<input checked="" type="radio"/> Feed/Beam/Height/Chuck/SwingTubeLength
<input type="radio"/> 6 Axis	

H Shape:

H Shape	
Axis	Axis Type
<input type="radio"/> 4 Axis	
<input type="radio"/> 5 Axis	
<input checked="" type="radio"/> 6 Axis	<input checked="" type="radio"/> Feed/Beam/Height/Chuck/SwingTubeLength/SwingDiameter
	Control Type
	<input checked="" type="radio"/> Chuck
	<input type="radio"/> Gantry

C shape

C shape	
Axis	Axis Type
<input checked="" type="radio"/> 4 Axis	<input checked="" type="radio"/> Feed/Beam/Height/Chuck
<input type="radio"/> 5 Axis	
<input type="radio"/> 6 Axis	
	Control Type
	<input checked="" type="radio"/> Chuck
	<input type="radio"/> Gantry

L Shape



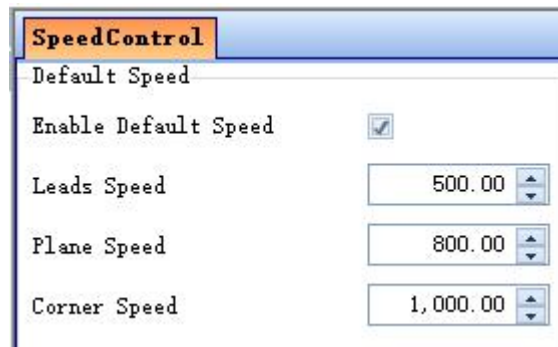
Code file type:

Users can choose the extension of the code file.



Speed control:

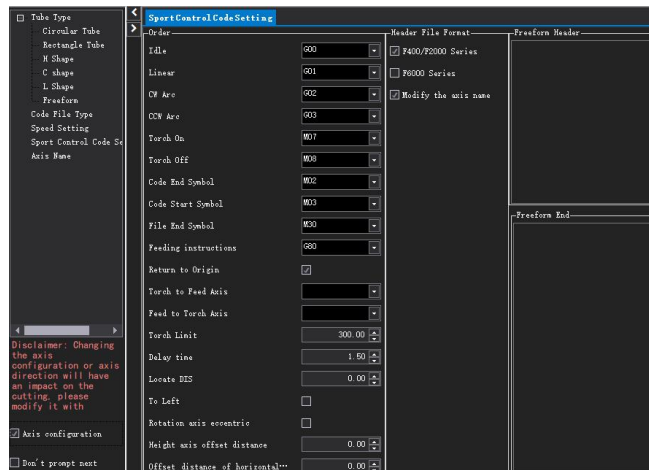
Users can set the corresponding speed according to their own needs.



Sport control code setting:

If there is no special requirements, users do not modify the sport control code.

Please choose the header file format according to your own machine. Or users can set freeform header.



Axis name;

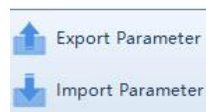
Password:123456.

Users choose the corresponding axis name according to their own equipment. The letter represents the name of the processing axis, and the direction "+" represents the positive direction, "-" represents the negative direction.

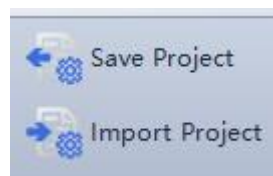
Axis Name			
Axis Name		Axis DIR	Proh
Feed Axis	X	-	
Beam Axis	Y	+	
Height Axis	Z	+	
Chuck Axis	A	+	
SwingAlongTubeLengthAxis	B	+	<input type="checkbox"/>
SwingAlongDiameterAxis	C	+	<input type="checkbox"/>
Torch Axis	U	+	

Export parameter:User can save the parameter to location, which can be used in future.

Import parameter: The software will reset the parameters according to the parameters imported.



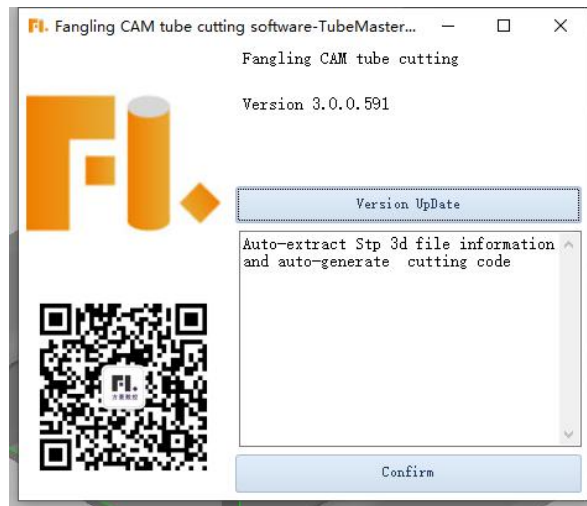
Save/Import Project: The information of the imported parts or the created parts can be saved, (SJX format),such as leads/start point/bevel • • • .(The nesting information will not be saved) The next time you need this part, just import the part in SJX format.



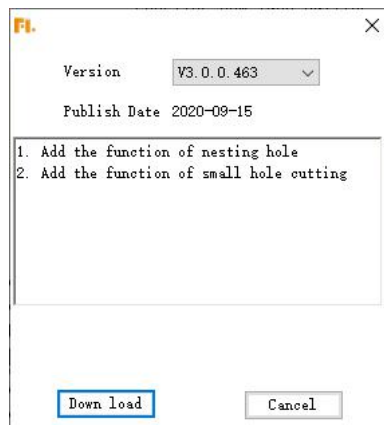
7. Information

7.1Version

Users can check the version of the software, and scan the QR code to follow the Wechat official account .



Version update:Users can download other versions of the software, the information box is the added or optimized functions.



7.2Help

The function description can be viewed here. Click on the section you want to know to see the function description. Some common questions can also be answered here.

8.FAQ

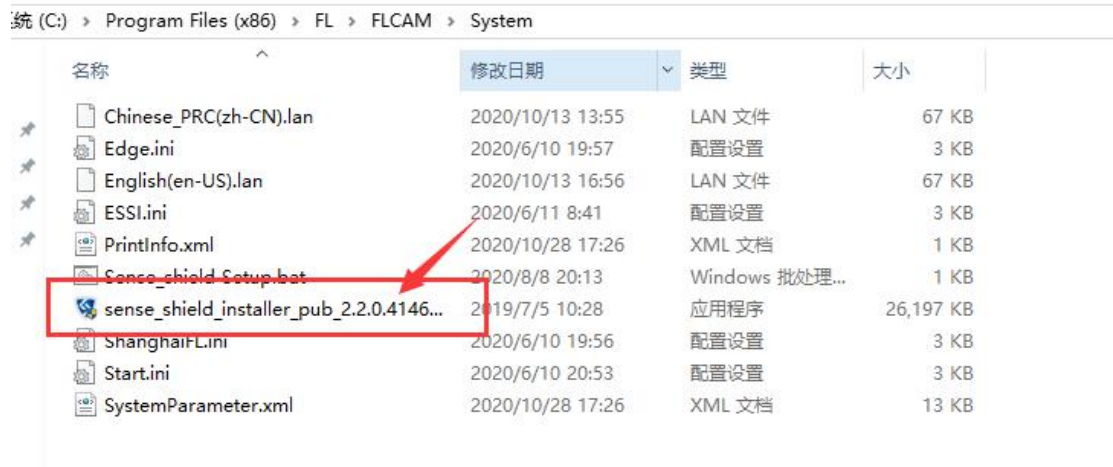
Q1: In WIN7 and above system, the software crashes when opening it.

A: When installing software in WIN7 and above system, select “run as administrator”, after successful installation, you can use it normally when you “run as administrator” .

Q2:The software can not open.

A:1.The dongle is not plugged in, or the notch in which the dongle is inserted is not in good contact.

2.The dongle driver was not installed successfully. Find the file location of the software and install the dongle driver.



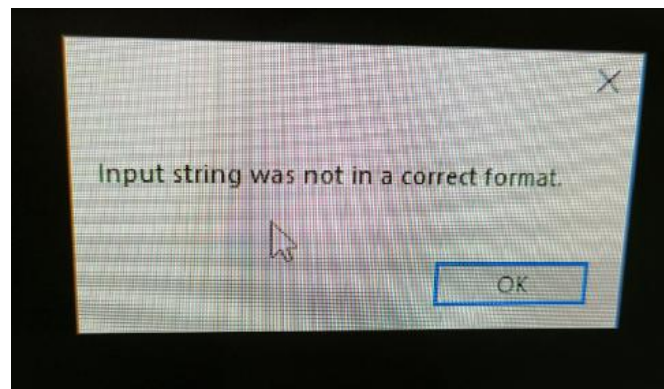
Q3:The software can not open part.

A:The location of the saved part cannot be in Chinese, nor can the model name be in Chinese.

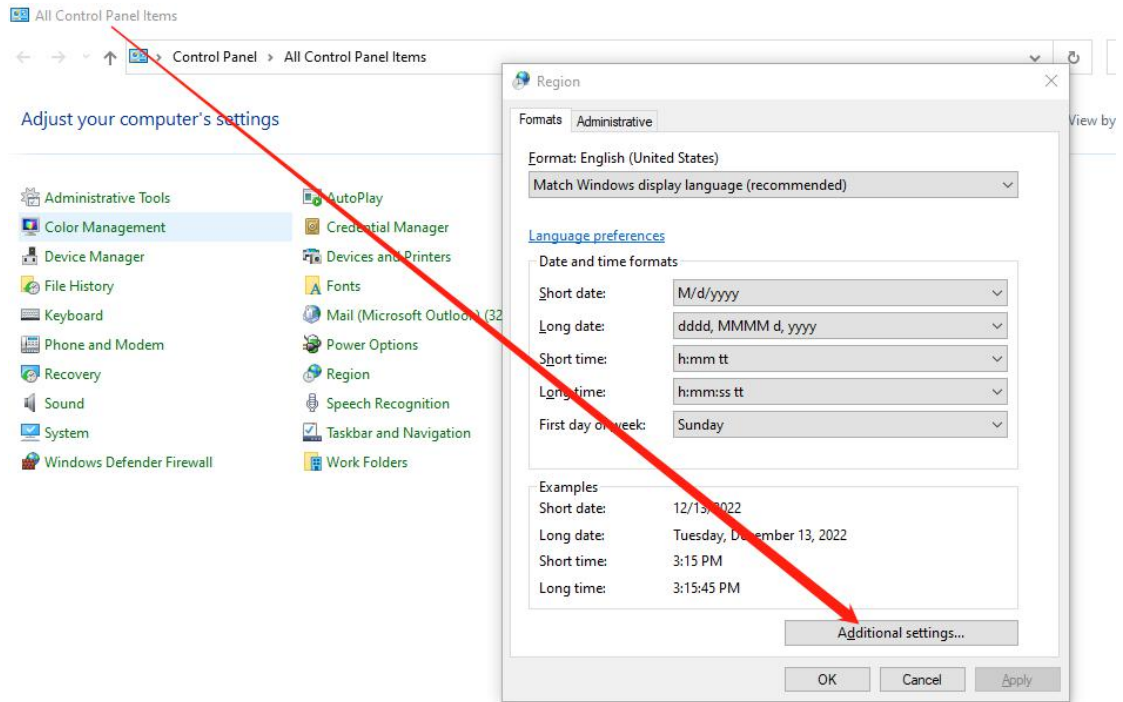
Q4:Password

A:123456

Q5:The system digital display format causes the software fail to open or report an error.



Step1: Open *Control panel* and find *Region* function.



Step 2: Change the decimal symbol and choose ".".

